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# MOTOR AGE

VOLUME XXII CHICAGO, AUGUST 29, 1912 NUMBER 9

**NET SALES GAIN 194 PER CENT**
*over corresponding 11 months of previous year*

*NOT SILENT—but, "a sound so faint one can scarce distinguish it from silence"*

***The American Tourist, Fully Equipped, $2350***

Four passengers. Motor, four cylinders, 4½-inch bore, 5-inch stroke. Wheel base 118 inches. Tires, 37x4 inches; front and rear on Q. D. demountable rims.

*$2350 includes regular equipment as follows: Electric light dynamo outfit complete with generator and storage battery supplying five lamps; $50 Warner speedometer; fine plate glass wind shield; Disco self-starter; fine mohair top and curtains; high tension magneto and storage battery; one extra rim; shock absorber; robe rail; foot rest; horn; jack, tools and tire repair outfit.*

*Self Starting* **AMERICAN UNDERSLUNG** *Electrically Lighted*

THE "American Underslung" is being adopted on all sides. Its design is the chief topic of conversation. It marks a transformation in automobiles. It forces the conventional "overhead" frame further and further into the past.

Eight years' results in the use of the underslung principle brings an universal demand in every territory. Unquestionable evidence is the increase in sales of 194 per cent in eleven months over the corresponding period of a year ago.

Here is a line of cars of superior construction. Their distinctive lines force inquiries. They are fundamentally different but not freaks. They abound in talking points for the dealer. We back them up with the most attractive sales contract of the season.

The low center of gravity *means safety* and *added comfort.*

The straight line drive means *less wasted power.*

The larger wheels mean *easier riding, tire economy* and *maximum road clearance.*

The underslung frame permits the direct and practical introduction of all these distinct advantages.

We have fully equipped each type. There are "no extras." We want you to investigate at once the "American Scout" at $1475, the "American Tourist" at $2350 and the "American Traveler" at $4500. Write today for a 1913 catalogue and simple treatise on the "Advantages of Underslung Construction." Address Dept. H.

**American Motors Company**
**Indianapolis, Indiana**

# The Specifications Sell MOON Cars

To All Dealers—J. W. MOON

Most All Cars Look Good — But — 4½" x 5" T-Head Motor — 46 Actual Brake H. P.— 121" Wheel Base — 36" x 4" Tires — Quick Demountable Rims — Chassis Built to Stand 70 H. P.— Value Found Only in The MOON — Sells the Cars

## MOON Service Best for Dealers and Owners

THE MOON Service to Dealers and Owners and the MOON Guarantee are as much a part of each sale as the Car itself.

Write for Descriptive Literature

## T-Head Motor Costs More to Build

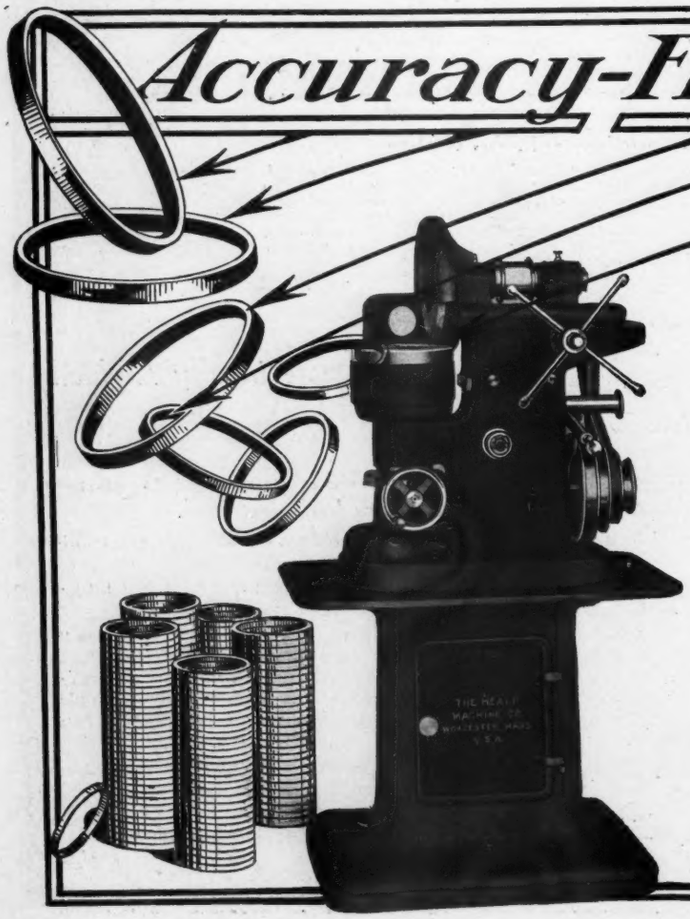
The famous MOON T-Head Motor—Long Stroke—4½x5—46 Actual Brake H. P.—represents five years of development. This genuine T-Head construction is identical with that of the best $5,000 and $6,000 cars. You cannot find it in any other car sold for under $3,000.

## Chassis Built to Stand 70 H. P.

Steering Gear — Transmission — Clutch — Universal Joint and Axles are built to stand 33⅓% more power than called for in the MOON "40." This is Protection —Plus.

## MOON Motor Car Co., St. Louis

# *Accuracy-Finish-Speed*



## OVER 800 4" PISTON RINGS Ground in 10 Hrs.

And every one accurately and beautifully finished.

This output has often been obtained on the HEALD PISTON RING GRINDER without sacrificing quality for quantity.

## The Heald Machine Company

26 New Bond St., WORCESTER, MASS.

# MOTOR AGE

Published by the
CLASS JOURNAL COMPANY
910 South Michigan Avenue
CHICAGO ILLINOIS

Volume XXII AUGUST 29, 1912 No. 9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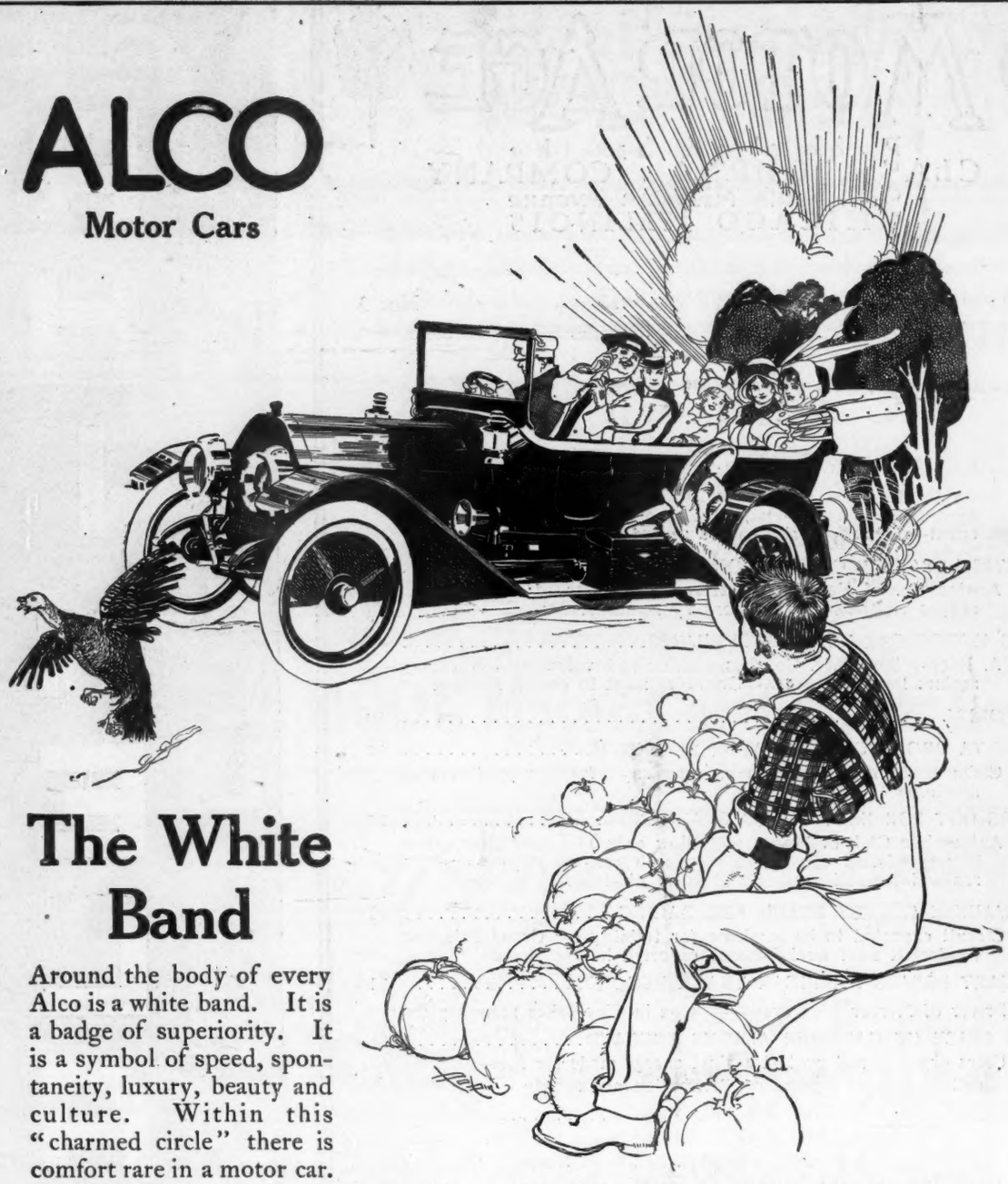
# ALCO

**Motor Cars**



## The White Band

Around the body of every Alco is a white band. It is a badge of superiority. It is a symbol of speed, spontaneity, luxury, beauty and culture. Within this "charmed circle" there is comfort rare in a motor car. One finds convenience capitalized with a wealth of little things such as wide doors, generous low seats, rich thick carpeting, an illuminated step and hardware wrought to endure.

One year ago the Alco adopted the white band. Since then seventeen cars have adapted it. It is simple to copy a white band or a door, but difficult indeed to copy what the white band stands for. No one can ever copy the Alco in full and charge less than $6000 for the imitation. That is the price of the Alco.

It is intended for those whose motoring tastes desire a car a little better than the usual high priced automobile.

**AMERICAN LOCOMOTIVE COMPANY, 1895 Broadway, NEW YORK**

**Builders also of Alco Motor Trucks and Alco Taxicabs**

Chicago Branch: 2501 Michigan Avenue.
Boston Branch: 567 Boylston Street.

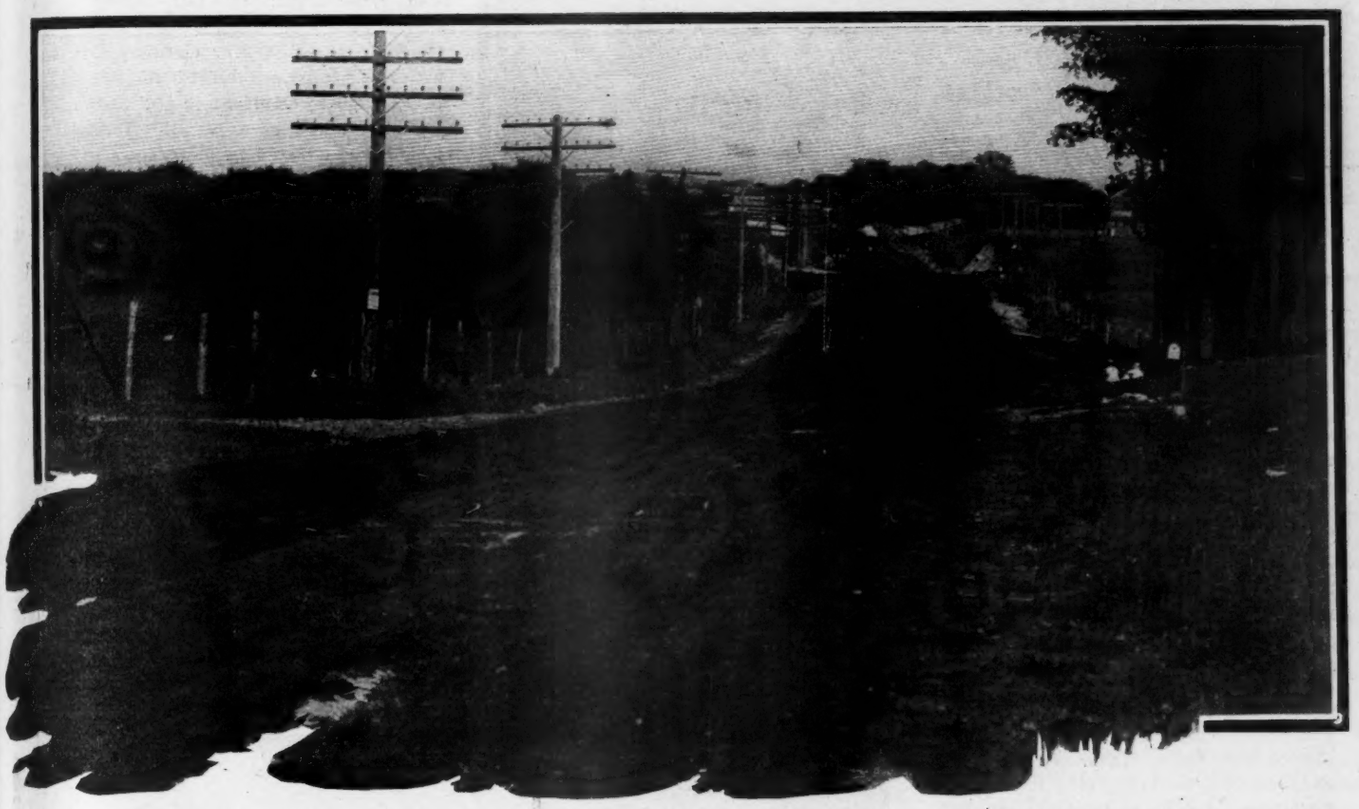
Canadian Headquarters:
4280 St. Catherine Street, West, Montreal.

**Twice winner of the race for the Vanderbilt Cup**

VOL. XXII, No. 9 CHICAGO, AUGUST 29, 1912 $3.00 PER YEAR

MOTOR AGE

# Elgin Races Bring Out Speed Talent



THE HOME STRETCH ON THE ELGIN ROAD RACE COURSE, WITH THE STARTING LINE AND GRAND STAND IN THE DISTANCE

## *Entry List for Meet of Chicago Automobile Club Contains Many Nominations—Fiat, Benz and Mercedes Among Foreign Talent—Notable Drivers Will Compete —Teddy Tetzlaff Breaks Course Record in Practice*

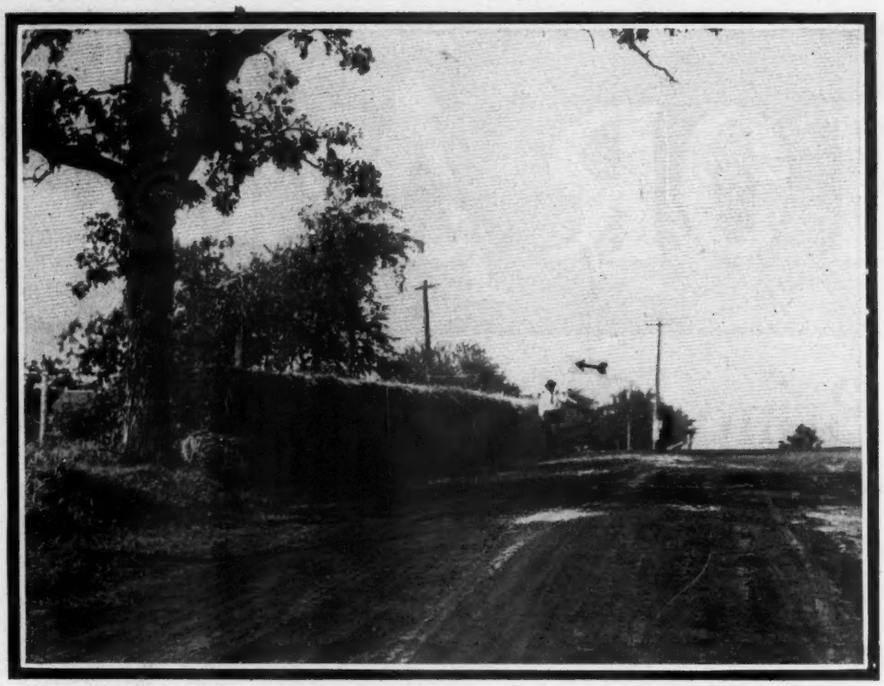
**By C. G. Sinsabaugh**

CHICAGO, Aug. 27—The Chicago Automobile Club and the Elgin Automobile Road Race Association, with only 7 weeks in which to work, are on the eve of the third annual Elgin road races, with every promise of a most successful meeting. They have a larger entry list than ever before, they have a good course, and there is every indication that they will be favored by a large attendance of enthusiasts.

There will be five events in all staged, non-stock instead of stock, as in previous years, and with a free-for-all for the trump card that has brought together a rare field of American and foreign cars and the pick of the drivers of the country. Benz, Fiat and Mercedes from the other side of the Atlantic will contest for supremacy with such makes as the Knox, National, Mercer, Falcar and Mason, while piloting these will be such celebrities as Teddy Tetzlaff, holder of the world's road record; Ralph Mulford, winner of the Vanderbilt; Ralph de Palma, almost winner of the 500-mile race at Indianapolis; Erwin Bergdoll, winner of the last Fairmount; Hughie Hughes of the Mercer, Spencer Wishart, Charley Merz, Gil Anderson, Neil Whalen and a host of lesser lights. Bruce-Browne was to have driven but his car did not arrive from France in time.

As usual, there will be 2 days of racing. On the first day there will be three events run simultaneously—the Jencks trophy race for cars under 230 inches, the Aurora trophy for 231-300 class cars and the Illinois cup for the 301-450 class. On the second day the Elgin National Watch Co. trophy and the free-for-all will be run simultaneously.

In these five events twelve makes of cars have been entered. There should have been thirteen, had the French Peugeot made good. An effort was made to get



SIDES OF THE COURSE BANKED WITH BALES OF STRAW

three of the French Peugeots for Elgin, E. C. Patterson of Chicago and R. J. Collier of New York offering to import them. It looked as if the deal would go through, for last week Paul Lacroix wired that he had cable advices from Europe to the effect that the cars were on the water and that they would reach New York on the Provence last Saturday. But the boat came in without the cars, and so hope of getting them was abandoned. This led to Patterson nominating David Bruce-Brown for his driver, the car selected being E. E. Hewlett's Fiat, which Brown drove to victory last year at Savannah. Patterson also entered Whalen in the National.

**Numerous Newcomers Entered**

Many new faces appear in the entry list. The Mason, represented by two different sizes of cars, makes its Elgin bow, while the Rayfield six is in the racing game for the first time. The Rayfield is made in Springfield, Ill.

Owing to the limited time in which the promoters had to work, the course could not be altered much, but then it did not need it. Of course, it would be better if a couple of narrow spots on the backstretch could be widened. This would have been attended to had it been known positively that the races were to be run; but there was so much delay in reaching a determination to have the meet that it was necessary to pass this up for this year. However, the course is in excellent shape today and evidently faster than last year, because of the time being made in practice. The turns at Hornbeek's and McQueen's have been cemented, as has the one at McLean's, so it is thought the racers will not rip them up.

As an additional factor of safety the Elginites are trying out a proposition of Tetzlaff's. That is to put baled straw on the turns so that in case a car does run wild there and run off the course it will hit the bales of straw and possibly save an upset. The straw bales being merely stacked up, the tendency would be to simply check the speed of the car and force it back on the course again.

**Practice is Conservative**

Although the course was practically ready last Saturday, it was not until Monday that official practice started. Then only six or seven cars came out, and no great speed was developed. The drivers were feeling their way, evidently waiting until today before opening up. The possibilities of the course were shown this noon when Teddy Tetzlaff in the Fiat 70 made four circuits, each one under the previous record for one lap—7:13, made by Mulford in the Lozier last year. His best effort was his second lap, which was covered in 6:55.23, an average of 74.2 miles per hour for the 8.4 mile circuit. Hughes in the Mercer also beat Mulford's old record, turning the trick in

**LIST OF ENTRIES FOR THIRD ANNUAL ELGIN ROAD RACES.**

JENCKS TROPHY.
Friday, August 30, 11 a. m.
96 miles, or 12 laps.

| No. | Car. | Entrant. | Driver. | Bore. | Stroke. |
|---|---|---|---|---|---|
| 41 | Mason Special | F. S. Duesenberg | H. Endicott | 3 3/16 | 5 |
| 42 | Ford 1911 T | Moe Brothers | F. W. Moe | 3 3/4 | 4 |
| 43 | Herreshoff, 20, 1909 | Herreshoff Motor Co. | W. G. Wordingham | 3 3/8 | 3 5/16 |

AURORA TROPHY.
152.5 miles, or 18 laps.

| | | | | | |
|---|---|---|---|---|---|
| 31 | Mercer, 35 C | Mercer Auto Co. | E. Pullen | 4 3/8 | 5 |
| 32 | Falcar Special 1912 | Fal Auto Co. | Hastings | 4 1/8 | 5 1/4 |
| 33 | Falcar Special | Fal Auto Co. | Wilbur | 4 1/8 | 5 1/4 |
| 34 | Mason Special | F. S. Duesenberg | Roberts | 3 7/8 | 5 |
| 35 | Mercer 35 T | Mercer Auto Co. | Wishart | 4 3/8 | 5 1/4 |
| 36 | Mercer 35 T | Mercer Auto Co. | Hughes | 4 1/8 | 5 |

ILLINOIS TROPHY.
203 miles, or 24 laps.

| | | | | | |
|---|---|---|---|---|---|
| 21 | Stutz 1912 | Stutz Motor Car Co. | Anderson | 4 3/4 | 5 1/2 |
| 22 | Rayfield six, 1913 | Rayfield Motor Co. | Hobbs | 4 | 5 1/2 |
| 23 | National 40, 1911 | Fred Cummiskey | Whalen | 5 | 5 11/16 |
| 24 | Stutz, 1912 | Ideal Motor Car Co. | Merz | 4 3/4 | 5 1/2 |

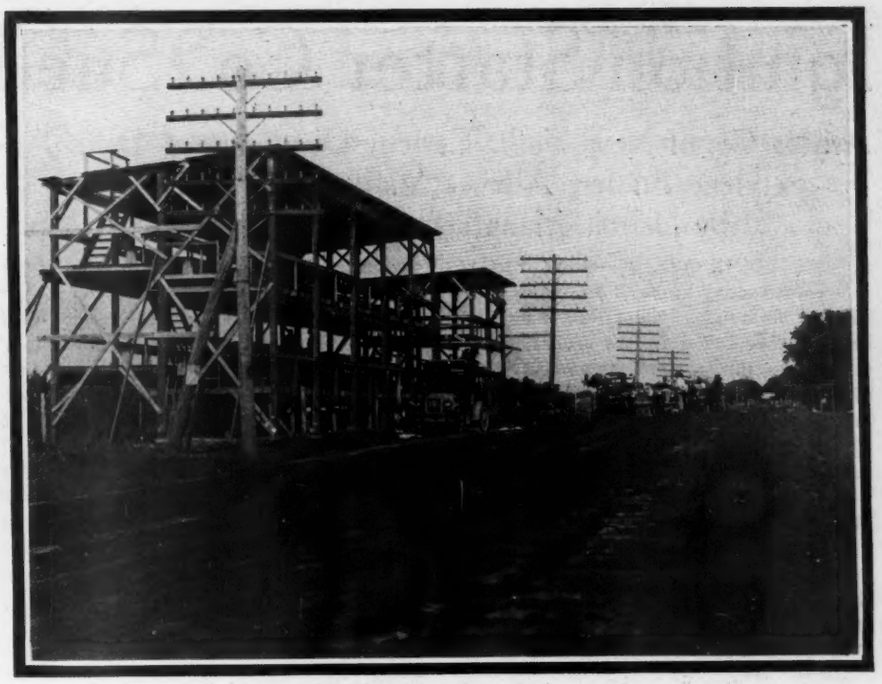
WORKING ON CURVE AT THE SOUTH END OF TRACK

7:10.52. The two were the only ones who really opened up.

Mulford met with hard luck today when his mechanic, Chandler, was backkicked by the motor, the starting crank hitting him in the leg and somewhat incapacitating him. Later on Mulford had clutch trouble, but it is hoped he will be able to fix it in time to start Saturday.

**Good Work by Association**

The organization of the meet has been thorough although hurried. The Elgin Automobile Road Race Association, made familiar with the work by 2 years of experience, has attended to a thousand and one details. It has seen to fixing the course, securing the soldiers and most important of all, financing the meet. The insurance proposition threatened to be a stickler for some little time, which delayed matters considerably. No American companies could be found willing to undertake it, and even the English Lloyds quibbled some over the details. At one time it looked as even this would fail, whereupon the enthusiastic Elginites started to underwrite it themselves.



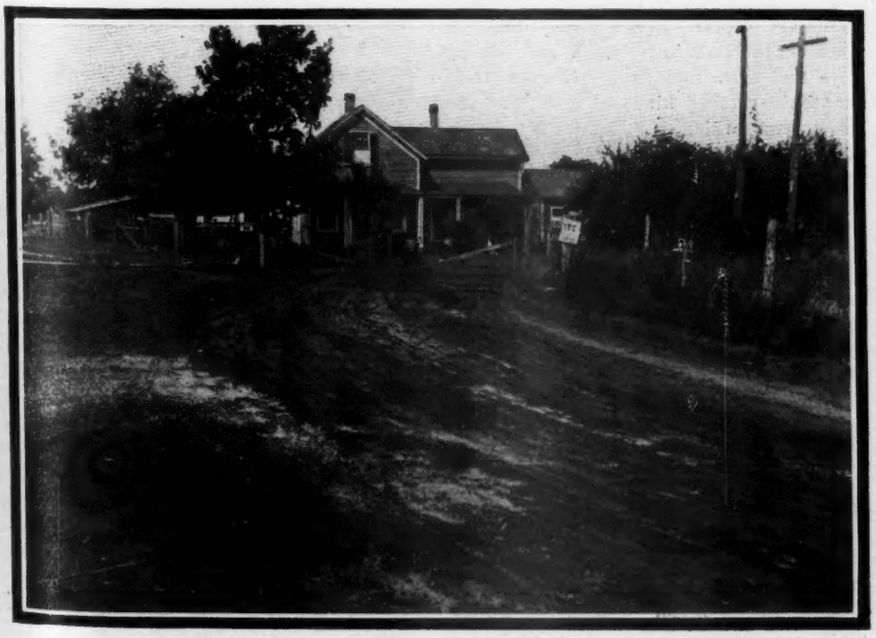
PRESS AND JUDGES STAND AT START AND FINISH LINE

ELGIN NATIONAL TROPHY.
Saturday, August 31, 11 a. m.
254 miles, or 30 laps.

| | | | | | |
|---|---|---|---|---|---|
| 1 | Knox Six | Ralph Mulford | Mulford | 4¾ | 5½ |
| 2 | Mercedes | W. H. Bertrand | Clark | 5⅛ | 7⅛ |
| 3 | Mason Special | F. S. Duesenberg | Roberts | 3⅞ | 5 |
| 4 | Mercedes | E. J. Schroeder | De Palma | 5.2 | 7.06 |
| 5 | Fiat Seventy | E. E. Hewlett | Tetzlaff | 5¼ | 7½ |
| 6 | Falcar Special | Fal Auto Co. | | 4⅛ | 5¼ |
| 7 | Stutz 1912 | Stutz Motor Car Co. | Anderson | 4¾ | 5½ |
| 10 | Falcar Special | Fal Motor Co. | | 4⅛ | 5¼ |
| 11 | National 40, 1911 | Fred Cummiskey | Whalen | 5 | 5[11]/16 |
| 12 | Stutz 1912 | Ideal Motor Car Co. | Merz | 4¾ | 5½ |
| 14 | Mercer 35 C. | Mercer Auto Co. | Wishart | 4.39 | 5 |
| 15 | Mercer 35 T. | Mercer Auto Co. | Hughes | 4⅜ | 5 |

FREE-FOR-ALL.
306 miles, or 36 laps.

| | | | | | |
|---|---|---|---|---|---|
| 1 | Knox Six | Ralph Mulford | Mulford | 4¾ | 5½ |
| 2 | Mercedes | W. H. Bertrand | Clark | 5⅛ | 7⅛ |
| 4 | Mercedes | E. J. Schroeder | De Palma | 5.2 | 7.06 |
| 5 | Fiat 70 | E. E. Hewlett | Tetzlaff | 5 | 7½ |
| 8 | Benz 1911 racer | E. Bergdoll | Bergdoll | 6.2 | 6.2 |
| 11 | National 40 | Fred Cummiskey | Whalen | 5 | 5[11]/16 |
| 15 | Mercer 35 T. | Mercer Auto Co. | Hughes | 4.39 | 5 |



THE HAIRPIN TURN ON THE ELGIN COURSE

Enough were found to raise $15,000 for this purpose, but luckily it was not needed, for Lloyds finally straightened out matters so the policy was issued last week.

In the matter of soldiers, permission was secured easily from Governor Deneen of Illinois to use the militia, and with this sanction troops from Elgin, Aurora, Oak Park, Rockford, DeKalb and Woodstock have been signed to guard the course next Friday and Saturday. In all there will be 250 of the soldiers, more than last year. Extra precautions will be taken this time to keep the course absolutely clear of spectators.

**Promotor's Energy Rewarded**

The Chicago Automobile Club had a hard task in rounding up the entries and it is to its credit that it was able to list the star aggregation which is presented. Fred J. Wagner, working in the east, and F. E. Edwards, chairman of the technical committee of the American Automobile Association, in the west, are responsible for the thirty-four cars that are booked for the speed battle. The club's cup of happiness would have been filled to overflowing had it been possible to have secured the Peugeots, for it would have given an international flavor that would not have been without its effect on the motoring public of the central west. As it is, though, the club feels well satisfied with the showing it has made in this department and feels that it will stand favorable comparison with what Milwaukee will have to offer. The list of officials included men prominent in motoring, reading in part as follows:

Honorary Referee—George E. Hunter.
Referee—David Beecroft, A. A. A. representative.
Clerk of Course—Morton H. Luce.
Technical Executive—F. E. Edwards.

# Ignition Starter Co. Sued on Contract

## Aristos Co. of New York, Eastern Distributor of Disco Acetylene Starter, Alleges Violation of Agreement by Detroit Manufacturer in Court Action

NEW YORK, Aug. 27—Word was received today by E. B. McDuffee, president of the Aristos Co., of New York, that suit has been filed in the United States district court for the eastern district of Michigan on behalf of the Aristos Co., demanding damages of $325,000 from the Ignition Starter Co., of Detroit, alleging breach of contract.

According to a copy of the bill of complaint the suit is based upon seven causes of action. The bill alleges that the Aristos Co. has been the eastern distributor for the Disco starter. That as such it purchased upwards of 4,000 starters for more than $50,000 and it complains that the contract conditions under which the starters were purchased were violated by the defendant company in numerous particulars for which damages of $100,000 is dtmanded.

For violation of an alleged agreement not to advertise the Disco in the eastern section of the country except with reference to the Aristos Co. as eastern distributors, $10,000; lack of service, $75,000; various elements of damage and loss caused by the alleged actions of the defendant company, $94,000 and for other reasons, $21,000.

The suit is a law action and the usual course of such proceedings is to reach an issue on the pleadings within 6 months of the date of filing and a hearing soon thereafter.

### VANCOUVER HOLDS BIG SHOW

Vancouver, B. C., Aug. 24.—The Vancouver second annual show held under the auspices of the British Columbia Auto and Motor Trades Association and Premier McBride, is now in full swing, and is one of the finest displays ever seen in western Canada. It is being held in the stock judging pavillion, which, in addition to a floor space in the arena of 26,000 square feet, has a seating capacity for over 7,000 people. Last year's display in the machinery building was admitted to be a success, but this year's show is at least five times as extensive, it being estimated that over $1,000,000 worth of cars are now on exhibition.

A pleasing feature of this year's show is that the association under whose auspices it is being held is now representative of the entire trade in this city, so that the exhibit embraces cars of every description—commercial and pleasure, gasoline, steam and electric—as well as a wide range of all motor accessories.

A feature of the show is the display of commercial cars, which is so great that special arrangements will be made in connection with next year's show for a separate exhibit of this class. Some idea of the growth of the motor industry along these lines can be gathered from the fact that a little over 2 years ago there were twenty motor trucks in this city, and at the present time there are over 200.

As an evidence of the interest taken in making a perfect exhibit, the fact may be mentioned that it has cost $4,500 to put the floor in condition to suit the exhibitors. This is in addition to the expense of the decorations which must be seen to be appreciated. The whole interior of the building is covered with artistic decorations the colors of the association, green and gold predominating.

Among the makes of cars on exhibition are the Flanders, Detroit electric, McLaughlin, Glide, Peerless, Hudson, Hupmobile, Stevens-Duryea, Russell, Tudhope, Everitt Abbott-Detroit, Marathon, Federal truck, Cadillac, Winton, Albion truck, Argyll, and Packard.

Vancouver is a motor city. This is not only on account of the saving of time effected for the business man in going from home to office, but because of the pleasure to be derived from jaunts into the country over roads which, through the efforts of the various motor associations are rapidly being put into shape to rival the most famous thoroughfares in the world.

At the present time there are in this city about 1700 power-driven machines, including motor cycles and business trucks, the latter of which are coming more and more into favor—through their adaptability to all kinds of work, and the speed with which the work is accomplished compared to that of horse-drawn vehicles.

### ATLANTA'S FALL SHOW

Atlanta, Ga., Aug. 22—Plans are going steadily forward for Atlanta's third auto show, which is scheduled for the early fall. Instead of having the show at the tag end of the southern buying season, as was the case last year, this one will be given at a time when southerners are beginning to buy cars, it will come at a time when money is easiest in Dixie and it will come before any other shows have taken the edge off the enthusiasm of prospects. Already arrangements have been made to combine with another exhibition which comes after the motor show in the matter of decorations and in this way the motor show will get the benefit of decorations that cost $16,000 at a price a great deal less than that. Wylie West, acting as chairman of the show committee of the Atlanta Automobile and Accessory Association, is in general charge of the work.

### IOWA'S STATE SHOW

Des Moines, Iowa, Aug. 24—The third annual Iowa motor car show held in connection with the Iowa state fair opened August 22, and will continue until next August 30. Thirty local dealers and a number of factories not represented locally have exhibits at the show. It is a business show strictly and no pretenses at decorations are made. The show is being held beneath the steel ampitheater at the race track. As approximately 300,000 Iowa farmers attend the state fair annually, and the farmer is the big source of business for the dealers of this state, the local dealers are expecting many sales before the fair is over. A large number of subagents will be appointed to handle the increased trade expected as a result of the stimulus to be given motor car buying by the agricultural element.

### REORGANIZE BERKSHIRE COMPANY

Boston, Mass., Aug. 27—A meeting of the stockholders of the Berkshire Motor Co. was held in Boston a few days ago for the purpose of reorganizing the concern. The Pittsfield Electric Co. recently placed an attachment for $2,500 upon the stock of the company and this brought about the plan to reorganize because of the effect upon the company's credit. It is believed that with the reorganization perfected the company will be able to tide over its difficulties and continue in business. The greater portion of the plant was moved some time ago from the Pittsfield Electric Co.'s building on Renue avenue, Pittsfield, Mass., to Cambridge, Mass.

### ATLAS MAY CONSOLIDATE

Boston, Mass., Aug. 27—There is some talk now of the Atlas Motor Car Co. of Springfield, Mass., making a consolidation with a large western truck manufacturing company in case the plan for an increase in the capital stock of the company of $100,000 is not carried out. The receivership of the Atlas Motor Car Co. of Indianapolis prevented the Springfield company from receiving the Silent Knight motors with which it was equipping its cars, so some plan had to be evolved in order to keep the company going and not have the present shutdown of the plant last too far into the 1913 season. Manager P. A. Williams is unable to predict just what course the directors will pursue at the meeting that has been called shortly, at which time the fate of the hoosier concerns will no doubt be decided.

# King Motor Car Co. Is in Difficulties

## A. Harvey Sons Mfg. Co. Files Petition in Involuntary Bankruptcy Against Detroit Concern—Creditors Meet to Consider Action—Early Settlement Expected

DETROIT, MICH., Aug. 28—Special telegram—At a meeting of the creditors of the King Motor Car Co., held at the Pontchartrain hotel on August 26 it was unanimously agreed that bankruptcy proceedings should be instituted at once against the King company. The stockholders of the company were also in favor of such action. Accordingly a petition in involuntary bankruptcy was filed August 27 by E. G. Wasey, acting for Graves & Hatch, attorneys for the A. Harvey Sons Mfg. Co., Ltd., of this city, which firm is one of the principal creditors of the King Co. The Harvey company has been furnishing principally flywheels to the King company.

At the present time the judges are out of the city so that the petition will not be acted upon until Monday or Tuesday of next week, when it is probable that the Security Trust Co. will be named as receiver. It is expected that the plant and machinery will be sold to the highest bidder and that the manufacture of King cars will be discontinued at once according to Mr. Wasey. The liabilities of the King company are approximately $361,000 while a representative of The Motor and Accessories Manufacturers' Association recently appraised the assets at $132,000. This, figure, however, is considered to be rather high by the creditors, who believe that a settlement on the basis of 25 cents on the dollar is all that can be expected.

### BUSINESS IN NORTH YAKIMA

North Yakima, Wash., Aug. 24—This city, with a population of 15,000, bought 107 cars in 1912, according to figures by dealers there. The sandy, dusty roads through the reclaimed desert lands made the low-priced lighter cars more in demand, as they have been found to stand up better under conditions in the valley.

There were sold in North Yakima in the summer passed sixteen Hudsons, seven Everetts, thirty Fords, eight Overlands, four Reos, ten Studebakers, two Whites, five Velies, one Leverne, five Cases, five Michigans, four Mitchells, three Franklins, three Chalmers, five Oaklands, one Cadillac, two Stoddard-Daytons and one Pierce-Arrow.

### ESTERLINE MOVES TO SPEEDWAY

Indianapolis, Ind., Aug. 27—Announcement was made last week of the purchase of one-half the capital stock of the Esterline Co., LaFayette, Ind., by Carl Fisher and J. G. Allison, owners of the Prest-O-Lite Co. and the Indianapolis Motor Speedway. The capital stock of the company is $250,000. The plant at present located at LaFayette, Indiana, will be moved to Indianapolis, and will locate at Speedway, Fisher and Allison's "Horseless City." There is to be no change in management.

Although no announcement hitherto has been made, it is known that the company has had under test for more than a year, a combined electric starting and lighting equipment for motor cars.

The Esterline Starter is to be unique in many respects, and a rather radical departure from the electric starting devices now on the market. One of the most important lines to be manufactured is a new electric lamp for motor vehicles, which the company has developed.

### MAY ALLOW CARS IN PARKS

Washington, D. C., Aug. 28—Whether motor cars should be allowed in the national parks of the country will be a question of discussion at this year's conference of park superintendents to be held in Yosemite National Park early in October.

Secretary of the Interior Fisher decided recently that the problem was becoming so important that it should be studied carefully and he is inviting members of motoring associations and all interested in any way with the question to go to the Yosemite in October to take up the problem.

Hundreds of requests reach the Interior Department yearly asking permission to take cars into national parks and bills granting such rights have been introduced into Congress. All the requests have been denied because of the danger to other travel.

### WINDSHIELD LITIGATION

Troy, O., Aug. 27—The Troy Carriage Sunshade Co., holder of the Lingley windshield patent No. 890667, covering shields having the double-arm joint, so constructed that the upper sash can be angled to provide the ventilator, rain view and other positions necessary in a shield intended for fore-door bodies, has taken a decree by consent from the Polson Mfg. Co., of Buffalo, that institution agreeing to discontinue the manufacture of such a type of shield, it is announced. It also has taken a decree by consent from the Sprague Umbrella Co., of Norwalk, O., which institution has arranged to license under the Lingley patent.

### IGNITION STARTER REORGANIZING

Detroit, Mich., Aug. 26—Growth of the Ignition Starter Co. is evidenced by the news that this concern is reorganizing and increasing its capital to $500,000. To manufacture the Disco electric lighting, starting and ignition equipment the plant of the Gray Motor Co. has been taken over, giving the Ignition Starter Co. 20,000 square feet of additional floor space. The increase in the capital stock has been based on the increased value of assets of the company and for putting new capital into the business for further developments.

### HOLDS STATE LAW SUPREME

Milwaukee, Wis.—A decision by Attorney General Bancroft of Wisconsin that no city, village, county or other form of government lesser than the state can make any laws or ordinances fixing requirements with regard to the operation of motor vehicles which conflict with the state law has brought dozens of cities and villages to their senses.

The state law, which is declared supreme by the attorney general, fixes the speed of motor cars in cities at 15 miles per hour, and on country roads at 25 miles per hour. The object of the law is to make the speed limits uniform throughout the state. Some cities have made limits of 10 and 12 miles per hour, while Milwaukee county has passed a law making the limit on country roads 20 miles per hour. All of these ordinances are outlawed by the decision, although many city attorneys declare they will carry the cases to the highest court to determine if the state has the power to rule absolutely in such cases.

La Crosse, Wis., has an ordinance fixing the speed at street intersections at 6 miles per hour. The attorney general says local requirements are taken care of by the provision in the state law which requires every driver to proceed at a speed which is "reasonable and safe" at all times.

### BOSTON TO HAVE TRUCK GARAGE

Boston, Mass, Aug. 27—The Fenway Garage Co. was formed in Boston last week, carrying a capitalization of $425,000, the common stock being $250,000, with $175,000 5 per cent gold serial bonds. The new company has purchased 67,327 square feet of land bounded by Ipswich and Landsdowne streets and the American League baseball park. Plans have been drawn for a two-story building of reinforced concrete so arranged that other floors may be added later. The new company has taken over the taxicab business of Sanders & Butler, and the members of this firm have been engaged to manage the garage. The garage will be planned primarily for trucks and each floor will have an area of 50,000 square feet. At least 200 machines will be taken care of.

MOTOR AGE
Published Weekly by
THE CLASS JOURNAL COMPANY
910 South Michigan Avenue CHICAGO
NEW YORK OFFICE
239 West 39th Street
SUBSCRIPTION RATES
United States and Mexico
$3.00 per Year
Other Countries including
Canada $5.00
Entered as Second-Class Matter September 19, 1899, at the Postoffice at Chicago, Illinois, under Act of March 3, 1879

# Gauging Public Demand

CAR buyers today are exceedingly fastidious; they are a class that gauges very accurately the trends of car designs; they are a public that must be followed to the hour to be sure of a just estimate of its wants; and a public that will change its attitude in a few short months, in fact, it has been known to change in a few weeks.

WELL illustrated is this in the demand for starters a year ago. One concern in announcing a gas self-starter as stock 1912 equipment stampeded the entire market. Other makers in the same class were compelled to delay announcement until some make of starter was installed. It was not many weeks before every maker of medium powered cars was offering the self-starter as stock or at very little above stock. Several of the makers of high-priced cars did not put on starters; they reasoned that chauffeurs drove the majority of their cars and so the self-starter would not be demanded. By the end of the season not a few of these concerns were compelled to improvise the self-starter or face a surplus of cars at the end of the manufacturing year.

ALTHOUGH scarcely 2 months old, the 1913 season has witnessed several examples of the fastidiousness of the buying public. Some leading concerns announced the fitting of gas starters, but the public pulse had changed, it was not the pulse of 1 year ago, it was not the pulse of 3 months ago, and these companies had to revamp their starter equipment. So suddenly and strongly had the demand for the electric type advanced that they sought safety in it. While some of these leading concerns were aiming at fashioning their own course, at variance with public thought, several smaller makers were playing the role of imitators, saying "What So-and-So can sell will sell our cars." Here, too, was an error. The public had unconsciously framed its opinion, there had not been an outward positive expression on it; and the makers erred, and they erred because they had failed to keep closely in touch with the public pulse every week and month.

THE day is over when a maker can drive the people against their own best judgment. The man who drives the car, the man who rides in it, and his passengers cannot be stopped from framing their own opinions, and factory arguments cannot upset such deep-founded conceptions. The maker today who builds a product that will sell must keep his finger ever on the public pulse. It will not do to do it 3 months in the year, to do it 6 months out of the 12, or even 9; it must be 12 months out of every 12. It is one of the greatest problems the maker has. It is easy to follow. It is equally easy to err. The real facts are the only corner stones on which to build. The maker must learn these. So often rumors are misleading, and they are rarely credited. An illustration of the difference between rumors and facts was recently given by a leading car maker who wished to investigate a certain ignition-lighting outfit. Every other car maker had his reports of failure. From cities all over came similar reports. The wonder was how the company actually contrived to exist. The inquiring manufacturer made a caucus of every dealer selling the product in question. Not every dealer in one state, or in six states, but every dealer in every state in the country. The real facts being obtained every rumor of failure that had previously been so general was dissipated. It was discovered that in scores of cases rumors were based on stories created by unreliable salesmen. True to the laws of gossip these stories grew daily. It would have been easy for any maker to have been lured into dangerous channels by such reports, and only the wise maker, who got the reports, obtained the real estimate of public demand, as evidenced by that particular design.

GAUGING public opinion is a simple task. It merely means to get the facts, and not to base policies on hearsay or rumors. You can always get facts. Getting facts means getting to the consumer, or to some one else who has reached him and on whose statements you can rely. So often a manufacturing firm will leave the selection of a new feature of design entirely to the engineering department. This is all right providing this department keeps rationally close to public desires, but so often the engineering department is the farthest away from the consumer and consequently the last to dictate what shall and what shall not be in the question of car equipment. In factories where the engineering department keeps the field glass constantly focussed on the public, it can chart its course accurately but where the course is laid out within a four-wall room, without due consideration being given to the outside, it is certain that mistakes will be made, that changes will be made before the season is over, and that in every case the maker will have to pay for the experience. It is in furnishing the engineering department with the real facts on the consumer, that the sales and maintenance departments assert their rights to be factors in determining what shall and what shall not be incorporated in a new model. It is as an umpire of these various departments that the factory heads must sit and pass final judgment. By this program of design the manufacturer can be assured of selling at his entire output.

HOWEVER, from this it is not to be inferred that the buyer is an infallible judge of what is best in a motor car. Many good and worthy features have from time to time been incorporated in the design of conservatively designed cars, that owing to public prejudice had to be abandoned after a few seasons of vain attempt at education of the public away from its pet notions. Many features which if developed would have proven of great value, have thus been thrown in the discard. Not so very long ago a certain manufacturer who reputation for unconventional innovations was wide, attempted to introduce a new form of valve. After two or three seasons of desperate pushing he was forced to lay it on the shelf because the public refused to be shown. The comparison of Americans with Europeans in this respect has often been made; the claim that the French and English public was less conservative of standard practices in design, thus offering more encouragement to American inventors than they receive at home. This is undoubtedly true, as borne out by the experience of Charles Y. Knight, but had its root, no doubt, in the fact that the comparatively low prices of American cars are made possible only by our methods of manufacture in large quantities, the freaks of foreign practice being fostered under the expensive small-quantity manufacturing methods prevalent abroad.

# Alberta Proud of Its Motor Strength

EDMONTON, Alta., Aug. 24—Statistics compiled from government reports show that in comparison to population Alberta has more motor cars than any other province in the dominion of Canada, there being one car to every 124 persons, estimating the population at 374,663 and the number of cars at 3,000. Manitoba is second with one car to every 152 persons in the province, and British Columbia has third place with one auto for every 165 persons. Saskatchewan is fourth with one to every 194 persons. Ontario, which has the largest number of cars in use, reports one to each 344 of its population.

Nova Scotia has the smallest number of cars. The ratio of cars to the population there is the lowest. The province has one car to each 852 of its population, which is placed at 492,38. New Brunswick, with a population of 351,889, has 594 cars, while the province of Quebec, with 2,002,712 population, has 801.

**Prince Edward's Laws**

Prince Edward Island is the only province in the dominion which prohibits the use of motor vehicles on its highways and public places. The penalty for violating this law, which was enacted because it was thought necessary in the public interest and for the safety of the traveling public, is a fine of $500 or 6 months in jail. Public highway, in this act includes any highway, public street, square, alley, lane, park or any public place.

Transient cars are not registered in the province of Manitoba, where permits are issued for 30 days' touring. After that time the owner is considered a resident and has to take out a license. This law is said to be satisfactory to residents as well as transients.

Representatives of car manufacturers traveling through the Edmonton district report that western Canada is the best field, and local dealers say they cannot get cars fast enough to supply the trade. The people have money and are ready and willing to pay top prices for the best. While many popular priced cars are sold, the dealers find no difficulty in disposing of any vehicle that comes up to the mark.

**Demand for Trucks**

There also is a growing demand for motor trucks, which are operated at from 10 to 30 per cent less cost than horse vehicles. Market gardeners, dairymen and poultry growers in the rural districts tributary to Edmonton and the western cities generally are employing motor traction power to a large extent and it is predicted that this will have a beneficial influence upon the good roads movement.

It is estimated that fully 25 per cent of the cars exported from the United States is shipped to Canada. The accompanying

## Claim Made It Has More Cars Than Any of Other Provinces in Dominion

tabulation shows the value of imports in this line during the last 4 years:

| Year | From United Kingdom | From United States |
|---|---|---|
| 1908 | $186,224 | $ 714,497 |
| 1909 | 79,954 | 480,785 |
| 1910 | 114,871 | 1,644,431 |
| 1911 | 314,182 | 3,798,589 |

The foregoing figures show an increase of 68.7 per cent in the value of cars imported to Canada from Great Britain in the last 4 years and an increase of 431.6 per cent in the importations from the United States. The number of cars purchased from the two countries mentioned during the 4 years was as follows:

| Year | From United Kingdom | From United States |
|---|---|---|
| 1908 | 101 | 563 |
| 1909 | 48 | 469 |
| 1910 | 78 | 1,345 |
| 1911 | 240 | 3,207 |

These figures show a gain in number by the United Kingdom of 137.6 per cent, and by the United States of 496.6 per cent. The approximate average value of machines follows:

| Year | Average value of British Cars | Average value of U. S. Cars |
|---|---|---|
| 1908 | $1,843 | $1,269 |
| 1909 | 1,663 | 1,026 |
| 1910 | 1,472 | 1,223 |
| 1911 | 1,309 | 1,887 |

Some cars from France are sold in Canada and there are prospects that German manufacturers will do some business next year.

There is every reason to believe that the importation of cars from the United States will grow in proportion to the development and settlement of the country. This, of course, means also there will be increasing demands for tires and accessories.

**Assembling Plants Established**

American manufacturers have established assembling plants in various parts of Canada and it is announced that trade is brisk and the outlook for the coming year is bright. The western provinces will harvest this year the largest crops of grain, including wheat, barley and oats, in the history of the dominion. The production of livestock also is larger than at any previous time. As soon as the returns come in there will be more activity in all lines of trade. The settlement of vast acreage of tillable lands in Alberta and neighboring provinces too is bound to have a wholesome influence upon the automobile business in general.

## Coming Motor Events

*August 30-31—Elgin road races; Chicago Automobile Club; Elgin, Ill.
September 1-3—Ostend meet.
September 2—Track meet at Winnipeg, Canada.
September 3-6—Chicago Motor Club's truck demonstration.
September 8-25—San Sebastian Rally.
September 9—French Grand Prix; Le Mans, France.
*September 9-12—Commercial vehicle run; Chicago Motor Club.
September 11-14—Third annual reliability run of Automobile Club of Buffalo, Buffalo, N. Y.
September 14-21—Annual fall show; Chicago Automobile Trade Association.
September 17 — Grand Prix; Milwaukee, Wis.
*September 20—Wisconsin challenge and Pabst Trophy races; Milwaukee, Wis.
*September 21—Vanderbilt road race; Milwaukee, Wis.
September 17-20—Fire engineers' convention; International Association Fire Engineers, Denver, Colo.
September 25-October 6—Agricultural exhibition and plowing matches; Bourges.
September 30-October 5—American Road Congress; Atlantic City.
September—Track meet; Universal Exposition Co., St. Louis, Mo.
October 4-5—Track meet; Sioux City Auto Club, Sioux City, Ia.
October 6—Gallilou hill climb.
*October 7—National tour Detroit to New Orleans; American Automobile Association.
*October 7-11—Chicago Motor Club reliability run, Chicago.
October 12—Track meet; Rockingham park, Salem, N. H.
October 24-25—Banta Trophy Team match, Chicago Motor Club.
November 2-3—Splash guard competition; Versailles.
November 6—Track meet; Shreveport Automobile Club, Shreveport, La.

*Sanctioned by A. A. A.

**SHOWS**

September 23-Oct. 3—Rubber show, Grand Central palace, New York.
September 26-Oct. 6—Exposition agricultural motor cars, Bourges, France.
October 2-12—Fire show, Madison Square Garden, New York.
November 8-16—Olympic show; overflow November 22-30 Agricultural Hall.
December 7-22—Paris salon.
January 6-11, 1913—Cleveland show.
January 4-11—Montreal show.
January 11-18—New York pleasure car show; Automobile Board of Trade; Madison Square Garden and Grand Central Palace.
January 11-22—Brussels, Belgium show, Centenary Palace.
January 20-25—New York truck show; Automobile Board of Trade; Grand Central Palace and Madison Square Garden.
January 20-25—Philadelphia show.
January 27-Feb. 1—Detroit show.
February 1-8—Chicago show.
February 10-15—Chicago truck show.
February 10-15—Minneapolis show.
February 17-22—Kansas City show.
March 3-8—Pittsburgh show.
March 8-15—Boston show.
March 17-22—Buffalo show.
March 19-23—Boston truck show.
March 24-29—Indianapolis show.

## MEXICO STARTS ROAD WORK

City of Mexico, Aug. 24—As a first step in its plans for the construction of an extensive system of good roads, the federal government, aided by different state governments, has begun the work of rehabilitating the famous Camino Real, or main highway, which runs between this city and the port of San Blas on the Pacific coast, with a branch up the coast to Guaymas.

This main highway has a length of about 700 miles, and is a lasting monument to some of the wonderful public works accomplished during the days of Spanish control of Mexico. It originally was constructed more than 300 years ago under the direction of the government of Spain and at enormous expense.

# Rules Out for Next Year's Grand Prix

## Automobile Club of France Will Allow Only 14.1 Miles to Gallon in Way of Fuel Consumption to Each Car— European Makers Renew Interest in Racing

PARIS, Aug. 16—In its official rules just published for next year's grand prix race, the Automobile Club of France has determined an allowance of 20 liters of gasoline per 100 kilometers,—at the rate of 14.1 miles to the gallon— and fixed a minimum weight limit of 1763 pounds and a maximum of 2425 pounds, without gasoline, oil, water, tools or spares. The total distance of the race, which will be a 1-day event, will be about 560 miles, the course to be about 30 miles round and as near as possible to the city of Paris.

Minute precautions have been taken in the drawing up of the rules to provide against cheating. In addition to a fine of $2,000 and disqualification of the driver, his team mates and the firm proved guilty of an attempt to dodge the rules, the committee has decided that it will supply the gasoline tank, the piping, and all unions. The tank, which will be 39 inches in length and of a diameter to be determined when the total distance of the race has been decided on, must be placed across the frame to the rear of the two seats, it must not be encased or covered in any way, and the car must carry all spare tires and wheels across the frame to the rear of the tank.

The whole of the fuel to be used in the race will be put into the tank before the start; thus if the distance is 560 miles, the amount of gasoline aboard will be about 40 gallons. The gasoline allowance will be made at a temperature of 15 degrees centigrade, with rectification for any variation in tempeature from this standard. When the tanks have been filled on the day before the race, the filler cap will be sealed, all connections on the gas line will be sealed, and a control put on the carbureter, the car then being placed under military guard until the moment of the race. In all probability the committee will allow ½ a pint of gasoline to each man to prime his motor for starting up.

Permission is given the competitors to indicate the brand of gasoline they desire to use in the race, a list of ten different makes being quoted from which a choice can be made. The particular brand selected will be bought from the retailers in the ordinary sealed cans and only opened in the presence of the competitors for measuring and transferance to the tank. No facilities are given to foreign competitors to use their imported home brands of fuel. The construction of the tanks will be such that it will be utterly impossible to put gasoline in without detection.

By means of flanges on the two end plates of the tank, all the rivets will be external, thus forestalling any attempt to pass gasoline in through a hollow rivet; the filler cap too will be of a special type that cannot be tampered with. The disposition of the tank and tires has been decided on with the double object of allowing easy verification and putting all competitors on the same level regarding head resistance.

No attempt must be made to secure a stream line body, the opinion of the racing board being that the grand prix should be a test of motors and transmissions with no artificial advantage gained by the use of an appropriate wind cutting body. Limitation of the amount of lubricating oil and control of the number of tires used in the race was brought before the committee, but owing to the numerous difficulties no restrictions were imposed.

Under the rules any manufacturer can enter six cars at a fee of $800 per car, entries to be received by October 31 and to attain a minimum of forty for the race to be held. In view of the possibility of too large a number of starters the right is retained to reduce the number per firm, starting with the firms having the maximum number of cars entered, by the drawing of lots, or by the running of an elimination race, as may be considered advisable. From October 31 to March 1, 1913, entries will be received at double fees.

There is so much enthusiasm in France for motor racing and such general approval of the fuel limitation rules that a minimum of seventy cars is anticipated. Not only will the younger firms specializing in light medium powered cars come into the race with hardly an exception, but everything points to the return of the older factories having figured in the leading road races up to 1908, among them being Panhard, Renault, Mercedes, Benz, Mors, and de Dion-Bouton. The entry of Peugeot, Lion-Peugeot, Delage, Hispano-Suiza, Gregoire, Fiat and Bugatti, is already assured. The English contingent is likely to be heavier than in the recent grand prix race.

### PROGRESS OF ALCO TRUCK

Chicago, Aug. 27—With 3,026 miles of its transcontinental trip covered, the Alco truck of Charles W. Young & Co. reached Salt Lake City, according to latest telegraphic information from that city, and is pursuing its course to the coast by way of Ogden, Utah, and Reno, Nev. In making the run to Salt Lake City the truck pounded off many miles over summits, through canyons and along perilous cliff-side roads only 6 inches wider than the tread of the truck. In these regions the crew spent considerable time in planking weak bridges to avoid accidents. As topping the freak weather conditions in Wyoming—declared by the oldest settlers to be the worst in a decade—the truck ran into an August snowstorm that swept across the state.

### NEW ORLEANS MOTORIZING

New Orleans, Aug. 26—One hundred thousand dollars worth of motor fire equipment is to be installed in the city's new central fire station. It has been decided that all apparatus to go in the new building will have to be motorized. No provision is being made for the care of horses, in anticipation of their impending relegation to the discard.

SOUTHERNERS UNHITCH HORSES WHEN GLIDDEN PATHFINDER PASSES

# Milwaukee Course Ready for Racing

## Circuit Expected to be in Shape for Training for Grand Prix and Vanderbilt Next Week, When Speed Merchants Will Arrive from Elgin—Roads in Fine Shape

MILWAUKEE, WIS., Aug. 27—A week from today Bruce-Brown, DePalma, Hughes, Wishart, Tetzlaff and the rest of the galaxy of famous road race drivers will be spinning around the Vanderbilt cup course at Milwaukee, making an acquaintance with the turns. The finishing touches are being put on the parallelogram this week, and on next Sunday Contractor Michael Schmidt expects to be able to say to the entrants in the great speed carnival, "Go to it!"

Roads that 3 months ago were mere cow paths compared with the roads needed for high speed motor work are today as wide as the boulevards of the largest cities, and smoother. From 14 to 16 feet roadway width they have been made 40 feet wide, crowned just enough to drain them quickly in case of showers and giving room for four cars abreast should occasion demand that width. The Town Line road is a notable example of the wonder work of the builders, the .9-mile stretch having been widened from 12 and 14 feet—a single wagon track—to 30 feet of the smoothest and hardest road anyone has ever been able to find.

The turns as they are today will hardly be recognized by anyone who was familiar with the roads before the builders started work. The sharp turn from Burleigh street into North Fond du Lac road, at the intersection of Thirty-fifth street, the Milwaukee city limits at this point, is now an easy turn, measuring 120 feet wide at its greatest diameter. All of the land between Thirty-fifth and Thirty-sixth streets has been used in building the new turn. This turn the drivers will strike shortly after passing the start and finish line and will send them into the beautiful 3-mile straightaway on the North Fondy road.

The other particularly sharp turn, from the Town Line road into South Fond du Lac road at Sommerville, has been rebuilt into a round that is practically as good as the first turn. Two giant oaks, which the oldest settlers recall as big trees, have been cut away to give the turn a wide radius; the fences have been tore away and moved 40 feet inward.

The other two turns in their natural state were as good as the two sharp turns now rebuilt, but they have been improved very noticeably. The famous graveyard turn where South Fondy road runs into Burleigh street toward the finish line has been widened to 120 feet and the cars will be able to do their utmost in rounding Wanderers' Rest cemetery. Similar improvement has been made to the easy turn at the northeast corner.

The entry list will be announced a week from today. It contains all of the notables on the space eaters' list. For one thing, Bruce-Brown's French grand prix Fiat will be seen at Milwaukee for the first time in America.

Local interest in the Vanderbilt will be keyed up to the highest pitch by the entrance of a contestant by a Milwaukee man with a Milwaukee driver. Richard H. Knowles, scion of a wealthy Milwaukee family and one of the best known sportsmen of this territory, has entered a Lozier in the Saturday event, the Vanderbilt, with Harry C. Nelson, who has been driving Pope-Hartfords in track races in the middle west for 6 years. Knowles at first intended to strip his 1912 Lozier six for the race, but on further thought decided to buy a new car and have the factory put it in shape for racing.

An idea of the size of the crowd of visitors expected in Milwaukee for race week may be gained from the estimates which the Milwaukee Hotel Keepers' Association is preparing. Two hundred fifty thousand people are being provided for, with a leeway of an additional 50,000 should the situation demand it. The preparations are most elaborate, and it is safe to say that the man who expects to pay for his room and board in Milwaukee during race week will get a good bed and three square meals every day, and it will not cost him a cent more than board and room of the same class in any other city of the continent at any time of the year.

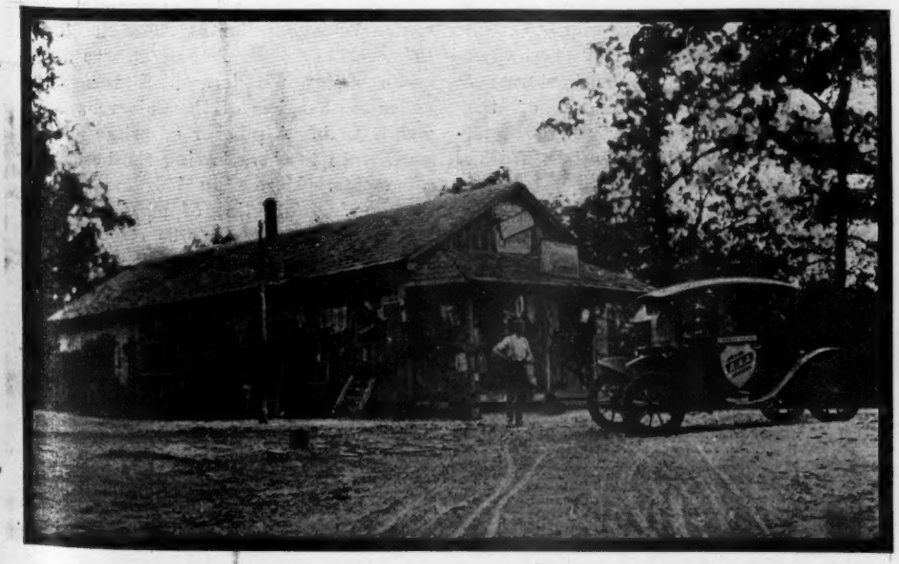
On Thursday noon twenty-two cars, one from the garage of each member of the Milwaukee Automobile Dealers' Association, will leave Milwaukee for Elgin to witness the meet and get a few additional pointers as to the conduct of a race meet under actual conditions.

### STUDEBAKER DISQUALIFIED

Minneapolis, Minn., Aug. 27—The Minnesota State Contest Board today disqualified the No. 3 Studebaker 20 entry in the runabout class of the fourth annual reliability tour to Winnipeg. This was the contestant with No. 2 Hupmobile for The Daily News cup. W. H. Soules, the driver, was charged with leaving the course by running around Foxholm, Minn., during the fourth day of the tour. A protest may be filed by Paul H. Bruske, contest manager for the Studebaker company. The Hupmobile was penalized fifty-eight points and the Studebaker was penalized twenty-three points.

To prove the worth of second hand cars, the Zekman Auto. Co., the only dealer in used cars in Minneapolis, entered an old Cadillac in the Winnipeg run. This car, which is 3 years old, went the route, the run to Winnipeg being made without penalization, a broken spring on the return costing 643 points. The car was entered by Zekman to convince his prospects that the second hand proposition is sound.

This car with the Marmon, was one of the only two cars not penalized for mechanical troubles ,the spring breakage not being included in that catagory. It is expected that this performance will prove a stimulous to second-hand sales in the Twin Cities. The aversion to the purchase of used cars in Minneapolis has proven a grave problem, most Twin City traders refusing to take them in trade.



GLIDDEN PATHFINDERS AT GENERAL STORES, POKES, MISS.

# Wishart Breaks American Track Records

## Driver of Mercer Wins Track Events of Columbus, Ohio Automobile Club—Wilcox in Cino Takes Second Place in 200-Mile Race—Many Marks Lowered

COLUMBUS, O., Aug. 26—Records were shattered at the second annual 200-mile race given at the Columbus driving park August 25 under the auspices of the Columbus Automobile Club. The records for 75 miles, 100 miles, 150 miles and 200 miles on a circular dirt track were broken before a crowd estimated at about 35,000. The race was successful in every way and there were no accidents of any kind to mar the pleasure of the afternoon.

Spencer Wishart in a Mercer finished first in 3 hours, 28 minutes and 4½ seconds as against a previous record on the same kind of track of 3 hours and 45 minutes. The others finishing inside the money were Howard Wilcox, in a Cino, time 3:35:10; Johnny Jenkins in a Cino, time 3:35:30;, and Neil Whalen in a National, time 3:36:49. Ben Lawwell in a Wescott also was in at the finish but was not in the money.

In all there were ten starters to the spectacular event. They were: No. 1, Charles Elliott, in a Firestone-Columbus; No. 2, John Raimey, in Ohio 99; No. 4, Spencer Wishart, in a Mercer; No. 5, Harry Knight, in a Knight Special; No. 6, Neil Whalen, in a National; No. 7, Ben Lawwell, in a Wescott; No. 8, Johnny Jenkins, in a Cino; No. 10, Fred Radina, in a Cino; No. 11, Harry Matthews, in an Ohio; No. 12, Marion Trexer, in a Stoddard-Dayton.

The track was in excellent shape and is considered one of the best in the country. More than 15 tons of calcium carbide was placed on the track to settle the dust and there was very little to annoy the drivers and spectators.

Wishart drove steadily throughout and did not push his car for the first 50 miles. After some jockeying, Wishart took the lead and held it with the exception of a few laps around the 50-mile period. At 65 miles the Mercer led, and never was retired from that position. It was after negotiating 103 miles when Wishart came into the pit for the first time, and then three tires were changed. At that time he was four laps to the good and left the pit still in first place. At 129 miles Wishart again went to the pit for tires and water, and at 180 miles the third stop was made, this time for oil. All told, he lost 10½ minutes in the three stops.

Bad luck followed Neil Whalen in his National when he had considerable tire trouble and some ignition trouble. Both of the Cino cars were in the pit frequently for tires and magnetos.

The Stoddard-Dayton was in the pit several times for engine trouble and later caught on fire. The flames were put out and the car re-entered the race but had no chance. The car was out more than an hour due to the fire. Harry Knight in his Knight Special had engine and carbureter trouble and finally withdrew after making 164 laps. Harry Matthews in his Ohio had tire and engine trouble and finally a burnt connecting rod and withdrew after making ninety-seven laps.

Charles Elliott in his Firestone-Columbus skidded into the fence while coming into the pit and broke the rear axle but resumed after repairs. He finally withdrew after making eighty-nine laps. John Raimey in his Ohio broke a connecting rod on the fourteenth lap and was out of the race for good.

The records broken were: Seventy-five miles by Wishart in his Mercer, 1 hour, 19 minutes and 38 seconds, as against the record of Strang at Columbus, Ohio, July 3, 1909, in 1 hour, 19 minutes and 39 seconds. One hundred miles by Wishart in his Mercer in 1 hour, 40 minutes and 51 seconds, as against Burman at the Columbus, Ohio, track July 3, 1909, in 1:41:00 2-5. He made the 150 miles in 2:34:05, which won for him the Virginia hotel cup.

### STARTS NATIONAL ROAD MOVEMENT

Washington, D. C., Aug. 24—During the closing hours of the second session of the sixty-second congress, Representative Carlin, of Virginia, introduced a bill to establish a commission the object of which will be to create a national interstate highway system. It will affect preliminary surveys of seven national interstate highways and the establishment of such highways. These highways are to be constructed from Washington, the capital of the United States, respectively to Portland, Me., Niagara Falls, N. Y., Seattle, Wash., San Francisco and Los Angeles, Cal., Austin, Tex., and Miami, Fla. The bill carries with it an appropriation of $1,000,000 for the making of the surveys, maps, profiles and estimates for the use of congress. The national and interstate highways are to be trunk-line highways, to which branch highways and good roads can be established throughout the country.

The measure was referred to the committee on post offices and post roads and will be brought up for consideration as early in the next session of congress as possible.

If a provision which was agreed to by the United States senate becomes a law, a magnificent boulevard will be built to connect Washington with Mount Vernon. After some opposition the senate indorsed an amendment to the bill which provides for the payment to the Mount Vernon Avenue Association of Virginia of the $120,000 which was loaned to the general government by Virginia in the early days of the republic and never yet repaid. The state of Virginia has assigned its claim to the association and the money, if returned, is to be used in the building of the boulevard.

### HIGHWAY BODY CRITICISED

Buffalo, N. Y., Aug. 24—The Automobile Club of Buffalo, N. Y. has come out with vigorous arraignment of the state highway commission appointed by Governor Dix alleging that the abominable condition of the roads throughout the state and particularly in Erie county has been brought about by political favoritism and incompetency. An official statement was made by the club detailing condition in certain localities and addressing several questions to the state executive but no reply has been forthcoming from the governor.

### BIG PARADE IN COLUMBUS

Columbus, O., Aug. 27—One of the striking features of the Ohio-Columbus centennial celebration at Columbus during the week beginning August 26 was a fantastic motor parade, which was given under the auspices of the Columbus Automobile Club. A number of prizes of cash were given to those having the best decorated cars. More than 150 cars were in the parade. The line of march included the principal streets of the city and was about 5 miles in length.

### SUMMARIES OF 200-MILE RACE AT COLUMBUS, O.

| Car. | Driver. | Time. |
|---|---|---|
| Mercer | Wishart | 3:28:45 |
| Cino | Wilcox | 3:35:10 |
| Cino | Jenkins | 3:35:30 |
| National | Whalen | 3:36:49 |
| Wescott | Lowell | Finished. |
| Stoddard-Dayton | Trexer | Out, car on fire. |
| Knight Special | Knight | Out, 165 lap, engine trouble. |
| Ohio | Matthews | Out, 98 lap, connecting rod. |
| Firestone-Columbus | Elliott | Out, 90 lap, rear axle. |
| Ohio | Rainey | Out, 14 lap, connecting rod. |

# Maine At Last to Get Good Roads

## Campaign Waged by Motoring Associations of That State Beginning to Bear Fruit in Way of Improvement of Highways—Bond Issue Contemplated

PORTLAND, Me., Aug. 26—Maine is at last sure of good roads. A campaign has been waged this summer and is still being waged that will result in highways fit to travel upon and of such good condition that motorists no longer will complain of the wretched state of roads in the Pine Tree state.

Hardly more than a year old, the Maine Automobile Association has taken up the battle for better conditions and good already has resulted. Meetings held in all parts of the state with Governor Plaisted in attendance as well as the state highway commission opened the eyes of the people to conditions at they have existed. On all sides, from motorists, carriage drivers, farmers and merchants, the demand has been made for goods roads.

**Poor Roads Lose Money**

It has been realized that Maine has been losing business by allowing conditions to continue as they have. Even this year, many motorists from out of the state have come for their vacation to the playground of the nation and have found the roads so bad they have written home to their friends not to come. They themselves have declared they never would again enter the state until the roads were improved. From the motorists who have stayed away, the merchants and hotels have lost thousands of dollars.

The Maine Automobile Association at once became alive to the situation. It enlisted the sympathy and aid of the Portland Board of Trade and the two organizations have worked hand in hand for good roads. Now the result of their energetic efforts is being seen in improved conditions along the principal thoroughfares of travel.

From Kittery into Portland, the road has been the subject of disgusted criticism for years, but this is now being placed in presentable shape. State Highway Commissioner Parker L. Hardison has contractors at work and good solid roads are being built. The M. A. A. itself laid out a detour route so that the dreaded Kennebunkport woods could be avoided and fairly decent roads enjoyed on the run into Portland. But they have gone still farther than that. One of the worst places in the state is in South Portland, at the very entrance to Portland. All the roads in this municipality are bad, so the Maine association took matters in its own hands. At Cash's Corner, near the boundary line of the city, it has erected an immense sign. It gives glaring notice to all motorists that the roads of South Portland are unsafe for travel and that they should not pass through this section.

The ire of Mayor John A. S. Dyer of South Portland was aroused. He declared that in return for what he termed this insult to South Portland, a campaign would be begun against speeders. But the asssociation kept its sign right there and it still presents its warning to all visiting motorists. Mayor Dyer and the other members of the South Portland city council have been forced to come to time. Already have they started to make improvements. More than that, they have asked the Maine Automobile Association to send a committee to meet with a committee of the council to compromise. The two committees will get together within a few days.

Elated over the success of the South Portland incident, the members of the good roads committee of the M. A. A., J. Clark Scates of Westbrook, D. W. Hoegg, Jr., of Cape Elizabeth and Walter B. Parker of Portland, have extended their campaign farther. A few days ago they took a trip to Brunswick, 25 miles from Portland, and called upon the selectmen of that town.

**Ultimatum to Officials**

Brunswick is a thriving place. It is the home of Bowdoin college, a great manufacturing town and a way point for all tours through Maine. The roads from Freeport to Brunswick are narrow and mostly of clay. Some of the hills are dangerous and the highway in wet weather is never safe for travel.

The members of the committee presented their case to the officials of the town. They gave an ultimatum. In brief it was that if the roads were not made safe inside of 2 weeks, a sign similar to the one placed in South Portland would be set up on the outskirts of the town and motor traffic diverted in some other direction. The warning had its effect and before the 2 weeks have expired, the selectmen declare they will have their roads put into a safe condition. The selectmen showed a willingness to co-operate and will do all in their power to improve conditions.

Even before the warning was given, the Maine association had diverted 300 motorists from the Brunswick route and sent them into the center of Maine by the way of Lewiston. The Brunswickians have felt the loss in revenue to them and are clamoring for good roads.

The good roads question has entered in the state political campaign as it never has before. Both William T. Haines, the candidate on the Republican ticket and Governor Frederick W. Plaisted, the Democratic candidate for re-election, have declared themselves as in favor of good roads.

In addition to voting for officers at the election in September the voters of Maine will have the good roads proposition placed squarely before them. According to the provisions of the Maine motor law, all the money received for registrations must be devoted to the building and maintenance of good roads. The present year saw about $200,000 collected from this source.

**Two Millions in Bonds**

Lyman H. Nelson, with this sum as a working basis, has come forward with a proposition that will be voted on by the people of Maine. His measure provides for the issuing of $2,000,000 worth of bonds to be used at once for the construction of good roads. The income received from motor car registrations, which never will be less than $200,000 a year will be used to retire the bonds and pay the interest. A constitutional amendment is necessary to bring this about and it is upon this amendment that the people will vote. Both the gubernatorial candidates have declared themselves in favor of the bond issue and the people in general favor it. It looks now as if it would go through with flying colors and as if Maine, by 1913, would have some of the finest roads in the country.

### CONVICTS TO BUILD ROAD

North Yakima, Wash., Aug. 24.—Governor Marion E. Hay of Washington has promised to put 200 convicts at work on state road No. 7, through the Snoqualmie pass in the Cascade mountains, connecting Seattle, Tacoma and other Puget sound cities with the central part of the state. The road which follows the trail over which the early cattle rangers drove their beeves from the Yakima and Kittitas valleys to the sound, is now in good shape for motor cars with the exception of about 20 miles which is only passable. Most of the motor car drivers who have made the trip either way this summer have shipped their machines that distance, although nearly 100 have driven entirely across and ferried the length of Lake Keechelus, cutting off three miles just east of the top.

### BUCHANAN KEEPS AXLE PLANT

Buchanan, Mich., Aug. 24—The motor car axle department of the Lee & Porter Mfg. Co. will remain in Buchanan. The deal by which this department was to have been taken over by a Kalamazoo company and removed to Kalamazoo has fallen through. The Lee & Porter company is considering the manufacture of car bodies as an addition to its present product.

# High Price of Gasoline Alarms England

## Users Organize and Protest Against Charge Made for Fuel—Investigation Made of Method of Distribution and Supply—No Scarcity Anticipated—Conditions in South

LONDON, August 16—The continual rise in the price of gasoline in this country to 37 cents per gallon has been met by organized opposition on the part of the users. Matters were brought to a head during the recent strike of the dock workers in London, the price at many garages being at once put up to almost prohibitive figures.

As a matter of fact, during the period of the strike, there was no actual shortage of supplies, but there was a great fear on the part of many of the retailers that stocks would run down rapidly, and a general shortage prevail. The matter appeared so urgent that the Royal Automobile Club held a conference at the club's premises in June which was attended by importers, retailers and consumers. The conference was held to inquire into various questions connected with the supply and distribution of gasoline in this country, and especially in connection with the existing high cost of the spirit to the consumer. The subject was freely discussed, and it was finally resolved that the Royal Automobile Club be asked to establish a gasoline committee to consist of delegates of the various bodies representing consumers of gasoline to inquire into the whole question.

The whole of the gasoline supply for London is delivered into tanks at Thames Haven, the property of the London and Thames Haven Oil Wharves, Ltd., a public wharfinger, and in that capacity its storage and other facilities are available for importers, merchants, or any other large consumer who might import. Its largest customers are, of course, the big oil distributing firms, but it is quite open to anyone to hire storage and the other facilities afforded by the company at reasonable terms. No monopoly or preferential rights is granted to anyone, and the constitution of the company specifically prohibits it, or any of its officials, having any interest in any oil company, or in any oil distributing business whatever. This company has ample facilities for storing sufficient gasoline and other oils, to meet the existing requirements of the country; an effective plant for separating and distilling work, also apparatus for the filling of tins, tank wagons, etc., and the total storage capacity is estimated at sufficient to supply the whole of the United Kingdom for one year. This company is old and well established, and the custom authorities accepts its reports and statements for taxation purposes.

It has been calculated that the cost of gasoline delivered at Thames Haven, including the return voyage of the tank steamer, is from 6⅓ to 6½ cents per gallon, the latter price allowing for the very high freight of $16.25 per cubic ton. The duty imposed adds 6 cents per gallon to this cost, so that, taking the price at 37 cents there is a difference of 23¼ cents on every gallon supplied to the private consumer. It therefore is obvious that importers of gasoline into this country are making a very high profit.

At a recent meeting held at the Royal Automobile Club, Sir Marcus Samuel, the head of the Shell Transport Co., addressed the meeting, and laid particular stress on the difficulties of transportation from Thames Haven. The investigations proved this is no real detriment, and the provision of other storage accommodation on the lower reaches of the river would not in any way reduce the cost to the consumer, but that the price of the gasoline can be manipulated by the large importers in whatever direction they may deem advisable. Further, that the Shell Transport Co. has obtained the hold of about 75 per cent of the gasoline trade in London, and a large part of that in other parts of the country. It will appear that the large demand for spirit in the United States has taxed the resources of the Standard Oil Co. and its associated company, the Anglo-American Oil Co., to such an extent that its imports have not been increased with the growth of the demand in this country, and until some new and powerful combination make a bid for the British market, the companies referred to are practically in the position of monopolists.

The activities of the committee appointed by the Royal Automobile Club, which consists of members representing all the various motor associations and the large users of gasoline, up to the present have been mainly spent in investigating the method of handling gasoline in this country, beginning with its import, following with its storage and transportation, and ending with its distribution to the consumer, together with the various regulations now in force appertaining thereto.

The committee has, obviously, not been able thoroughly to investigate all questions connected with its inquiry and consequently is not yet in a position to issue any comprehensive recommendations upon the subject. In view of the complaints which are being made, however, that the regulations for the reception and transport of gasoline in the port of London are out of date, and tend to hamper the free and unrestricted supply of the spirit to consumers at normal prices at all times, the committee has felt it desirable to issue a recommendation upon this point and the following resolution was unanimously passed at the meeting of the committee held in July 1912, and a copy forwarded to the Port of London Authority:

"That the gasoline committee recommends that, in order to improve the present method of conveying gasoline from Thames Haven by water, barges propelled by internal combustion Diesel, or equivalent, type engines capable of carrying 1,000 tons of gasoline be allowed to navigate the Thames as far up as is practicable."

From the information at present before the committee it would appear that if the port of London authority will grant permission for the transport of 1,000 tons in single consignments up the river the facilities for local storage will be improved and the possibility of a shortage in the near future owing to labor troubles and similar disturbances will be much reduced. The present consumption of gasoline in Great Britian is 80,000,000 gallons yearly.

**Gasoline Situation in Savannah**

Savannah, Ga., Aug. 24—Savannah is spending something like $10,000 more for gasoline this month than it spent 3 months ago. It is no secret that most of the gasoline used today, in Savannah and elsewhere, is used to propel motor vehicles or motor boats. Ask any car owner what he pays for gasoline now, and he will tell you 17½ cents a gallon. Also he will inform you that only a few short months ago he paid only 11 cents for the same amount of the necessary fluid.

Cent by cent the price has advanced, while the consumer stood helplessly looking on. Now it has reached 17½ cents, and soon may go to 18 cents or even higher. That is with the refineries.

There is consumed in Savannah today something like 160,000 gallons of gasoline every month. Before the price was advanced consumers spent about $17,600 each month for fuel for their motors. Now they pay $27,200 for their gasoline. Simple subtraction shows that they pay $9,600 more now than they did a few months ago.

In New York city there is said to have been an advance of $250,000 in the cost of gasoline within the past 3 months. It is only because Savannah has fewer motor cars that it does not pay as much. The same thing is true everywhere throughout the country.

Various reasons are assigned for this advance, but the simplest and most plausible is that given by a Savannah dealer in gasoline:

"From every 100 gallons of crude oil

refined," he said, "there are distilled 20 gallons of kerosene and 5 gallons of gasoline. The refineries are stocked up on kerosene and don't want to throw it away. According, they have raised the price of gasoline high enough to make it pay to distill it. Now it covers the worth of the waste kerosene too."

**Fuel Outlook in Canada**

Montreal, Aug. 23—The cost of running motor cars is increasing. E. A. Hewitt, the assistant manager of the Imperial Oil Co. Ltd., asked yesterday as to the influence which had caused the price of gasoline during the past year to rise about 5 cents a gallon, said that the enormously increased consumption of that product was responsible. From everywhere the greatly increased use of motor cars, launches, and machinery propelled by gasoline-motors had caused a greater demand, and the effect had been felt on the price, especially as production had difficulty in rising to meet the demand.

Out in the west especially, said Mr. Hewitt, where quick work in harvesting the crops is absolutely essential, has the use of traction engines increased, and it is the custom in many localities by the use of engines driven by gasoline to work by means of shifts every hour of the 24 in doing the various kinds of work necessary on the farm.

The price to the garages here now is 20½ cents, and they will charge a higher figure, probably 25 cents. It may be that as soon as the production adapts itself to the new conditions there will be a drop, but this is the situation at present.

### LE MANS PUTS ON BIG RACE

Paris, Aug. 13—In adition to the 3-liter class, it has been decided by the racing board of the Automobile Club of the Sarthe to open a class for all comers in its race at Le Mans on September 9. The two types of cars will race on one course, covering the same distance, but those in the big class will be held back at the start a sufficient length of time to make it possible for either one or the other type to win. The 3-liter class already is assured of success by the participation of the following firms: Lion-Peugeot, Alcyon, Schneider, Crespelle, De Bazelaire, Bugatti, Arrol-Johnston, Calthorpe, Koecklin, and possibly Vauxhall. There will be two valveless models, Schneider having decided to enter three poppet-valve models and one of its new rotary distributor 3-liter racers, and Koecklin running with a two-cycle car having a cylindrical sleeve combined with the piston. In the free-for-all class the club counts on the entry of one of the grand prix Fiats which has been bought by a French amateur, the Lorraine-Dietrich team, an Excelsior, Mercedes, and Rolland-Pilian.

# Arkansas Takes Kindly to the Motor

## County in Which Little Rock Is Located Has 2,500 Cars—Fruit Growers Just Becoming Interested in Use of Power Trucks—Roads of State Are Being Improved

LITTLE ROCK, Ark., Aug. 24.—The growth and progress of the state of Arkansas has been marked by the entrance of no factor more potent in its possibilities for the proper development of the state than the adoption of the motor car in all the departments of the commercial life. In this county in which Little Rock is located there are about 2,500 cars, 60 per cent of which are pleasure cars. There are about forty motor delivery wagons and about the same number of large motor-driven trucks for the handling of heavy freight.

In the fruit counties the use of the motor car is in an incipient stage, although the cars and their advantages are thoroughly known. There are a few of the motor trucks in use but the railway advantages are so excellent that the demand for the motor is at a minimum. But this weak demand for the truck is offset by a deep-rooted desire on the part of the fruit growers for the touring car, and the evenings are spent touring through the almost limitless orchards, whose long lines of trees stretch away until they are lost in the maze of the horizon.

In the rice district, which covers several dozen counties which are pictures of rolling prairies, the touring car and the motor truck hold about an equal footing. There is no stretch of land in the United States that offers a smoother track for the motor enthusiast than these slightly banked roads that stretch out for miles ahead, seemingly without end, and sometimes for miles as smooth as the asphalt streets of the cities. On each side of these race tracks—for so they are called—are the rice fields of Arkansas, which have been the wonder of the West. It is here that the advantages of the motor truck are most evident, and their universal use shows the appreciation of the rice growers. In the county in which Stuttgart is located, which is the leading city of the rice-growing district, there are about 132 pleasure cars and about seventy-five motor trucks, which includes all the various types of motor delivery vehicles and large motor trucks, for the handling of the rice. Some of this is brought to Little Rock on these trucks, owing to the good roads. Visitors also are frequently seen in this city from that point, making the trip, which is about 60 miles, in three hours.

In regard to the roads of the state, we can offer only one explanation, and that is the roads were built by Judge Joe Asher. These roads cover the entire state, and were placed on the present high plane by many organizations for that purpose, the most prominent of which is the Arkansas Advancement Association. These roads form a network all over the state, which stretch both north and south and east and west. The best example of the roads in the low country is near Stuttgart, to which city reference has already been made. The finest roads in the northern part of the state are those near the foothills of the Ozarks. The scenery here is unsurpassed. The tourist has only to steer his car over the smooth track, which runs for a moment straight ahead, only to swing unexpectedly with a long graceful sweep around some grassy foothill of the scenic Ozarks. As the tourist nears the city of Little Rock the roads become decidedly better, being macadamized instead of banked with crushed rock. This condition prevails throughout the county, sometimes stretching across several counties, and is the delight of the local tourist, whose cars are seen there continuously.

The demands of the law in this state in regard to the foreign state tourist are of no importance to the law-abiding citizen. The same laws that are in effect in all the other states of the union, in regard to speed, lights, and all the other precautions and logical rules of the highway, prevail in this state and nothing else is required. No tourist license is demanded. The bona fide owner of any other state is respected here, without molestation, and is given all the rights of the local men.

### SIZAIRE-NAUDIN SPLIT

Paris, Aug. 12—As the outcome of internal dissentions, the brothers Georges and Maurice Sizaire and the brothers Naudin have severed all connections with the firm of Sizaire-Naudin The financial management being unaffected, the company will continue under fresh engineering control. The brothers Sizaire, who are recognized among the cleverest of French engineers, were pioneers in the small-bore, long-stroke movement and 2 or 3 years ago met with a considerable amount of success in small-car races. It is believed that the four men will obtain fresh financial backing and establish a second Sizaire-Naudin Automobile Co.

### PURCHASE RUMOR DENIED

Racine, Wis., Aug. 27—Denial of the report that the Racine-Sattley Co. of Racine, manufacturing fine carriages and vehicles, has been purchased by a large motor car interest, is made by officials of the company here. The reason for the rumor is supposed to be the temporary shut-down of the big plant for inventory.

# Australia Through American's Eyes

## Harry W. Cooper, Former Chicagoan, Now Selling Cars at Sydney, Reports His Observations on Trade Conditions As He Found Them in the Antipodes—Good Advice Given Yankee Manufacturers As to Australasian Market

SYDNEY, Australia, July 15—Since coming here last Christmas from Chicago and establishing myself in the motor car business in this country, I have made a study of trade conditions in Australia and have had an excellent opportunity of observing things from the Australian viewpoint.

After more than 6 months' observation I have come to the conclusion that the car that has the best future in Australia is a 25-horsepower four-cylinder that will sell here for $1,000 and a medium-priced car that will sell for $2,500. The demand for cars of the Peerless and Packard type is not strong, the demand being limited by prejudice, to a large extent to such cars as Daimlers, Fiats and Napiers. The reputation of American cars has been hurt considerably by the preponderance of only the cheaper American cars heretofore in the Australian market. I am the agent for the Pierce-Arrow car, which is the highest grade American car Australians have seen, the Cadillac being the best representative of the United States previously. When visiting a prospect, on the mention of the Pierce-Arrow car, he immediately puts it in a class with the Ford, Flanders or Hupmobile.

**Demand for Big Cars Limited**

I do not look for a greater sale than from six to ten cars at $5,000 or more per year in Sydney or Melbourne respectively, as the demand for anything over $2,000 is very limited, and there is a strong natural preference for English products. Such cars as the Packard, Lozier, Peerless, Locomobile, Stearns, Apperson, Matheson and Simplex never have been heard of in this country.

The Rolls-Royce car is considered the world's best here, Madam Melba, who lives in Melbourne, being an owner of one. Medium-priced English cars are in great demand. Two-cylinder or buggy-types cannot be sold here. The prevailing demand is for five-passenger cars, with oversize tires, exceptionally high clearance, substantial springs, short turning radii and right-hand steer.

Sleeve-valve motors, such as the Silent Knight, are not in favor.

The demand is for large radiators, and in small cars the thermo-syphon system of cooling with a fan is given the preference. Long wheelbases meet with favor, and floating rear-axles are demanded. Front axles must be substantial in appearance, a heavy appearance in the steering connections and parts being imperative to sales. The Australian demands that the steering arm be above the axle, and that the tie rod be behind it. Irreversible steering is demanded, and hand and foot control. Carbureters of the double-jet type, gravity fed, meet with the most favor. Fixed or governed spark advance is very unpopular.

**EDITOR'S NOTE—The accompanying article on trade conditions in Australia was contributed by Harry W. Cooper, formerly manager of the Excelsior Supply Co. in Chicago, but now a dealer in the Antipodes.**

In regard to springs, the American manufacturers have the advantage over the Europeans, as those furnished on British cars are continually breaking and giving trouble, from which difficulties American products are notably free.

**Spare Wheels Popular**

Stepney spare wheels are popular here, as, due to the dearth of good wheelwrights, demountable rims are rare, although, were it possible to get them properly applied, the demand for them would be strong. Tire competition between American and European makers depends upon price for equal quality, and should American makers offer tires of equal quality to Michelins, Dunlops and Continentals, at the same prices at which they are obtained here, the demand for them would be great.

The majority of motorists still use gas generators, the demand for Prest-O-Lite being limited by the comparatively few service stations in the province. Electric light should prove popular, and a drawing card for such American makers as include it in the regular equipment, although there is some prejudice against their delicacy and susceptibility to damage from road vibration, which is severe on our roads. Tail lamps for Australia must be on the right side.

**Australian Tops Poor**

Australian tops are generally miserable affairs of sagging khaki. American silk mohair tops meet with favor, provided they are not black, which color in tops the Australian will not countenance. Runabout bodies, to be popular in Australia, must be of the three-abreast type, and rumble seats or rear gasoline tanks are decidedly unpopular, the motorists here preferring a tool box on the rear deck, provided with a brass rail. American bodies are not finished quite up to the European standard, and should undergo improvements to create a favorable impression. A peculiarity of Australian buyers is that a blue car, regardless of its make or price, will not be considered, as this color is universally considered the mark of cheapness and inferiority. Fore door bodies are decidedly popular, and ventilation of the dash is desirable. Windshields made in Australia are vastly inferior to those furnished in America, as those of local manufacturers are made with wood frames and are non-adjustable. Most English cars are delivered with five wheels, interchangeable Sanky all-steel and wire wheels preferred.

Regarding the electric situation, the only two cities to be considered are Melbourne and Adelaide. I have a Woods electric on demonstration now in Melbourne and on its first appearance on the streets, it created as much excitement as though a circus had come to town. I could not let it stand at the curb for 10 seconds without I had the running boards covered with people trying to look inside, and others trying to find the mechanism, etc. Sydney is out of the question for electrics on account of the narrow streets and steep hills. I doubt very much of the future of the electric even in Melbourne at the present high price. Consider that I must get $4,000 to get off right with a $3,000 American car. There is $210 duty on the body alone, 5 per cent on the value of the chassis, and 25 per cent of the value of the tires. On account of the heighth of the body, a very large case must be used, and the freight charged is according to the size of the crate; so that when I say that the duty and freight on my car cost me over $1,000, the high price that must be placed on the car in order to make a profit, is plain. Of course on an open car the freight is cheaper, and the body duty is not so high.

**The Electric Proposition**

If there is a high grade electric selling in the United States for $1,500, which could be sold in Australia for from $2,500 to $3,000, 100 such machines could be placed in Melbourne in the next 6 months. We have our charging system installed, and can take care of ten cars a night with our present arrangements.

Regarding motor trucks, small delivery wagons, of the three-wheel type, with a box forward to carry parcels in are in great demand, as are light 1-ton and under, chain driven trucks. The field has not as yet been broken into by American manufacturers, and the market for trucks of under three tons is promising.

American railway motor cars, motor farm machinery and tractors are now on demonstration, and are making good. Truck chassis are all imported, bodies being built locally. Trucks must have the motor under the hood. An American truck

was delivered to a dealer in Melbourne, and it is said that he cannot dispose of it on account of the motor being under the body.

It would further the sale of American cheap cars in Australia if the manufacturer would give the cars they intend to export a thorough and finished test. More attention should be given to the adjustment of various parts, the car should be given a thorough inspection, and tried out on the road before being placed into the case. If the factory appreciated conditions on this side, when a case was opened containing an American car, he certainly would have pride enough in his car to turn out a finished proposition. When a case containing a strange model of car is opened it usually is known by the majority in the trade, and quite a few owners of cars. If this car does not run right off the reel, smoothly and without a particle of trouble, everyone will knock it as another American fake, making it an almost impossible proposition to market; even if the trouble is no more serious than badly adjusted brakes or a slipping clutch.

I would advise anyone shipping cars to this country in quantities, and having faith in future business, not to send what they have left over from year to year, or what Americans won't purchase, but to cater to and appreciate business that is to be had over here, paying particular attention to quality and finish.

**Use Care in Shipping Cars**

I understand from a few agents of cheap American cars that their complaints do not meet with the proper attention at the factories. One firm landed twenty cars, and when opened, found the mudguards all damaged and bent close to the body. Any extra accessories desired by the agent should be allowed them at their cost by the factories. Expenses to import the machines certainly are high enough without the factories making an extra profit on the accessories that are regular on the car, but which the Australians do not want, and which should not be credited at a profit by the factory for the same reason.

Ford and Flanders have permanent men residing in Australia, taking care of the interests of the factory and agents, seeing that they are provided with plenty of advertising matter, and supervising its proper use and distribution.

Agents have many cancellations on account of cars promised by the manufacturer to come on a certain boat, failing to appear. The maker sells a car at a certain price, to arrive at a certain date, obtaining 25 per cent of the selling price, as a deposit, telegraphing the agent that the cars have been shipped on a certain boat to arrive at a certain date. When the boat arrives the cars are not there, being held on the American side. Of course cancellation and return of deposit money result.

Motor agents cannot handle supplies as a side-line with success. Other motor agents would not purchase of them. Motor car owners, unless purchasers of the car sold by the agent, would not enter the establishment of a competitor or of the dealer of whom their car was purchased. Conditions are radically different here from those in the United States. Agents for competing cars never meet. They are not congenial. Knockers' clubs are very prevalent in this country. If such an organization as the Chicago Automobile Trade Association could be formed in Sydney and Melbourne it would certainly put the business on a higher plane, to the good of all concerned.

**Bushman the Future Buyer**

The squatter or farmer in the country is approached from five cities, Brisbane, in Queensland; Sydney, in New South Wales; Melbourne, in Victoria; Adelaide, in South Australia, and Perth, in West Australia. These cities themselves have been worked thoroughly, and the future of the business does not lie there. The agents for the various cars send out salesmen from their salesrooms to the various small cities through their territories, soliciting business from the farmer direct. The competition has arrived at such a point that in the country districts three or four American cars selling for under $900 in the States are sometimes to be seen camped out in some very small town, on the trail of a customer. There are very many small cars purchased in the country, but the competition is very keen, keener, in fact, I believe, than in the United States.

## CANADIAN CARS IN AUSTRALASIA

Montreal, Can., Aug. 24—It has been known for some time past that the Montreal office of the New Zealand Shipping Co. has been placing a number of Canadian made motor cars in Australia and New Zealand, but few will be prepared to hear the dimensions to which this trade has grown. During the year ending May 1 last, 1,292 Canadian cars had been sent by New Zealand liners, and it is hoped to forward at least 1,800 during the ensuing year. The total number already shipped from the opening of the summer navigation season to date is 629 and the hoped for 1,800 mark should certainly be reached if not surpassed within a short time.

## CARS IN NEW BRUNSWICK

St. John, N. B., Aug. 24—The great increase in the number of motor cars in use in New Brunswick within the last 5 or 6 years is surprising. There are about 700 cars in use at the present time, representing an outlay of $1,400,000, and of this number St. John has 100, costing $200,000. These figures are remarkable because six or eight was the number of cars in this city 5 years ago, and at that time there were not one hundred automobiles in the entire province. The increase, therefore, has been more than 100 per cent per year for the last 5 years.

The prices of cars run from $900 to $7,000, and $2,000 is considered a fair average, as most of the cars purchased are of the grade costing between $1,500 and $2,500. That St. John is interested to a considerable extent in the most expensive cars, can be gathered from the fact that four or five $7,000 cars have been sold here recently. It depends largely upon the class of car purchased as to how long the owner runs it before exchanging it for one more modern. It has been pointed out that as a general thing, when an inexpensive car is bought, costing say $800, it is exchanged practically every year until the better grade of car finally is obtained.

It is generally felt here that this city is particularly hard on cars and that consequently the life of a car is briefer than in most places. Dealers, however, declare that this is not true, as cars for sale here are made with the conditions in view as are cars built for any other city with a large number of steep grades. The life of a car for this province is fixed about 8 years, running on an average about 7,000 miles a year, but it is said that in other parts of the country where the roads are in better condition the life is very much longer.

Lately many of the large business houses have adopted the motor cars for delivery purposes and the big delivery trucks are coming into use also. St. John is considered particularly adapted for motor trucks and delivery cars on account of the number of hills which are so hard on the horses. This city is said to resemble Seattle in this respect. Then again, here winter conditions are not so severe and cars can be used practically all the year round in this climate.

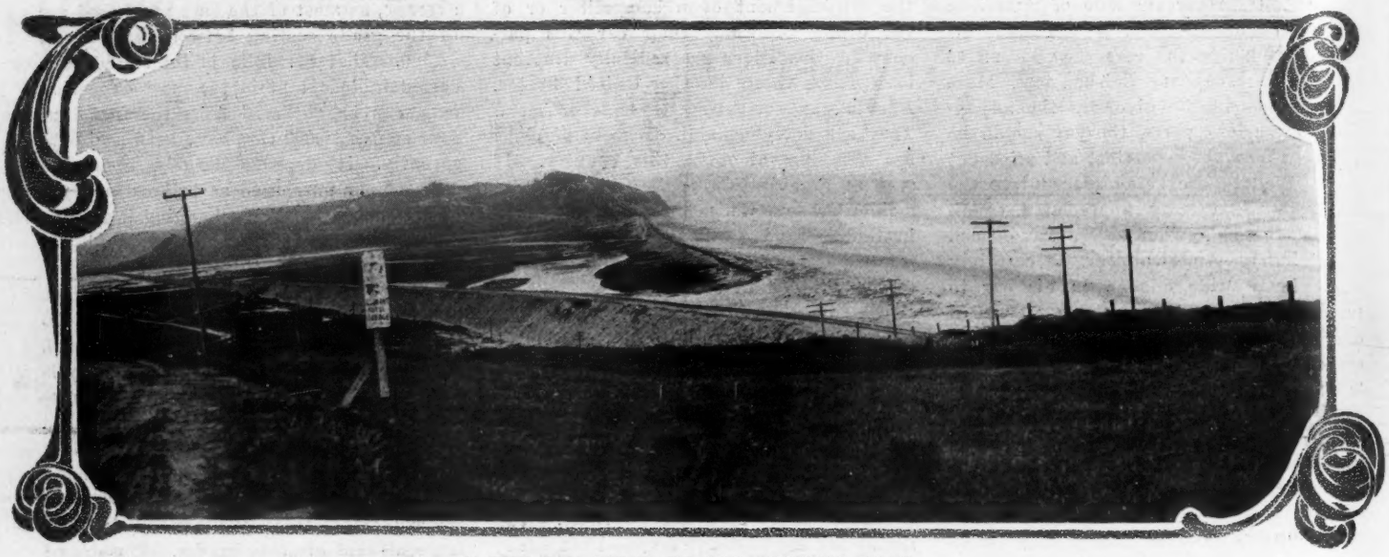
## CANADIAN CUSTOMS PERMITS

Tacoma, Wash., Aug. 26—The custom service in Canada has inaugurated a new system of permits which adds greatly to the pleasure in taking Canadian tours in a motor car. With the present arrangement it is possible to get a 7-day permit to drive a car, licensed in the United States, through Canada. This permit is secured from the custom official at the point of entry. Although the permit is issued for 7 days, if one desires to tour in Canada for a longer period of time, it is only necessary to have the permit renewed by the nearest custom official.

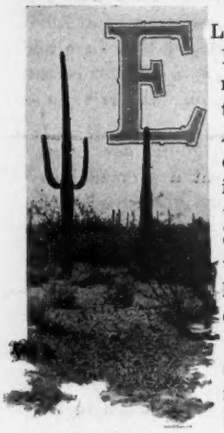
## CANADIAN OHIO STOCK OFFERED

Toronto, Aug. 27—The Canadian Ohio Motor Car Co. is offering for public investment $90,000 worth of 7 per cent cumulative preferred stock at $100 per share, carrying a bonus of 25 per cent common stock. The manufacturing plant will be established at Colborne, Ont., where the company has been granted a valuable site and exemption from taxes for a period of 10 years.

# Motor Routes and Touring Information



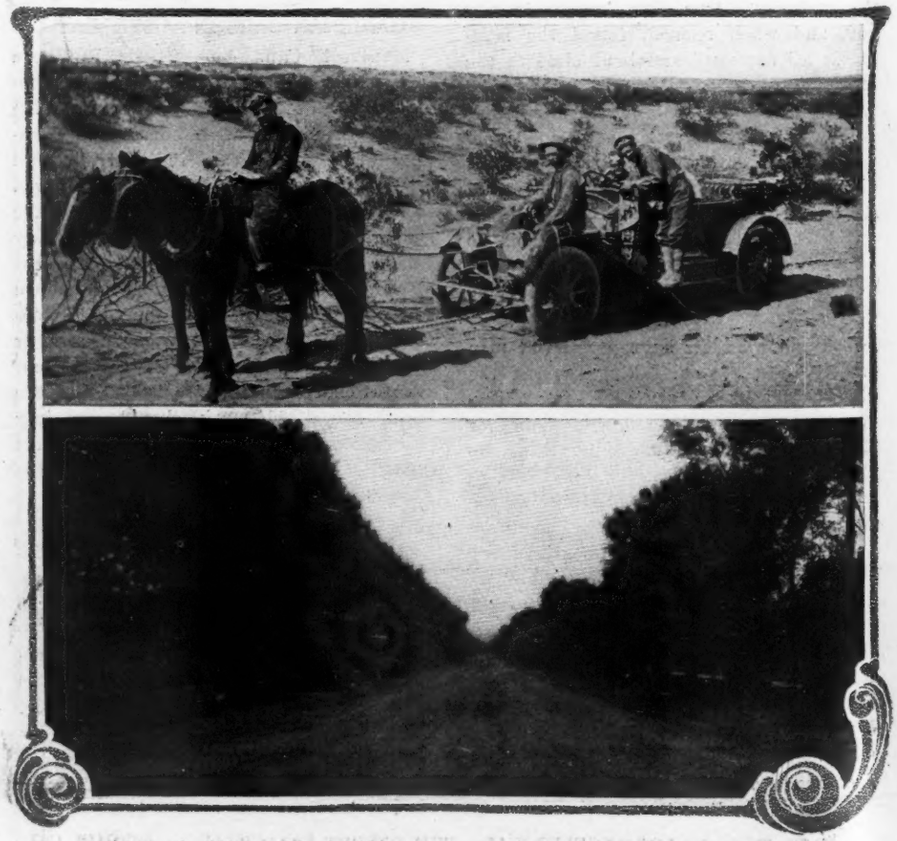
ON THE SAN DIEGO TO LOS ANGELES ROAD



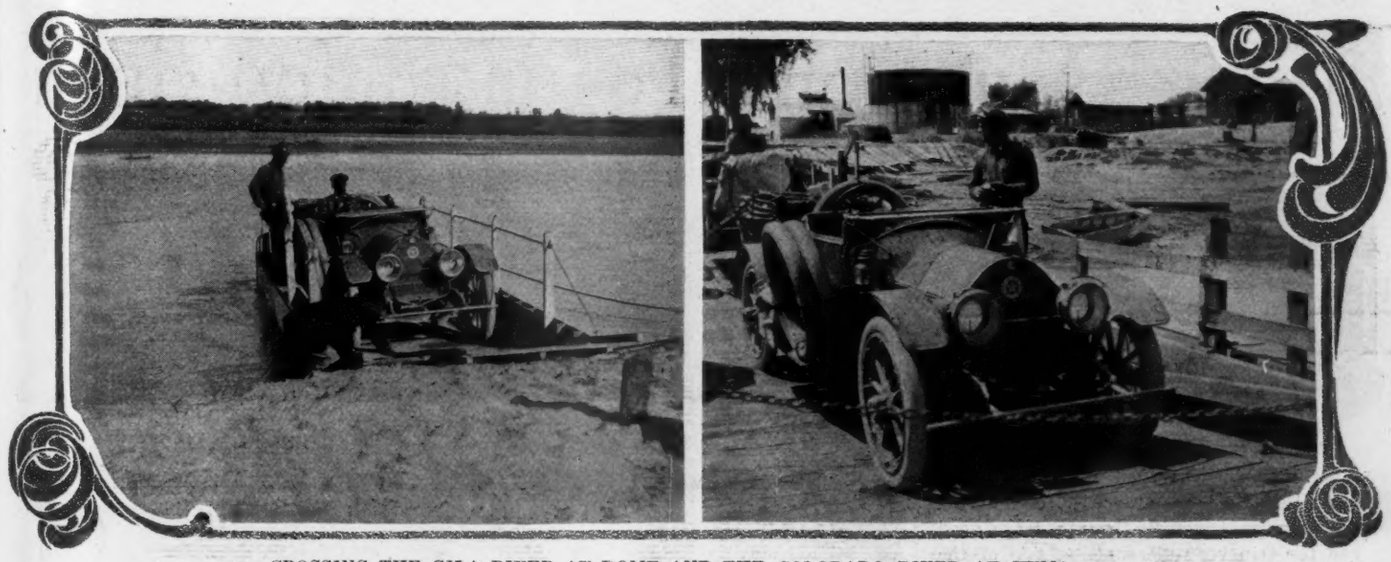
EL PASO, Texas.—Editor Motor Age — Having made all arrangements to leave El Paso on April 6, via the borderland route, my family leaving on the fifth, via the Southern Pacific for California, we were compelled to delay until April 9, on account of heavy rains and snow. Advised against doing so, we made the start and got away at 9 a. m. Twenty miles west took us to the New Mexico line, over a paved road, on to Mesquite, 32 miles, the road is fairly good, being graded. From Mesquite to San Miguel we crossed an adobe river bottom flat, which was about as bad, if not the worst part of road on the entire trip. Our wheels were up above the hub in mud and we were compelled to resort to the old team to pull us out, after which we wrapped our rear wheels with ⅞-inch rope and went on through all mud without further trouble. At San Miguel we found 2 miles of sand going up to the Mesa lands from river bottom with about an 8 per cent grade; we hired a team there to help us up, paying therefore $2.00. After reaching the top of the hill, we had a fair road to Afton, along the Southern Pacific railway. From thence to Deming, New Mexico, the road is fine, following the Southern Pacific line and newly built highway into Deming. We arrived at 7 p. m. and left immediately for Lordsburg, 60 miles, making the run in 2 hours and 15 minutes at night. From Lordsburg we got on the wrong road and after running all night wound up at a mine and had to return to within sight of Lordsburg to get on the main road to Douglas, Ariz. With good roads, crossing mountains, then Granite Gap, we arrived at Douglas at 6 p. m. Wednesday.

Bisbee is situated high up in the mountains, the elevation being about 6000 feet. The largest copper mines in the world are located here.

We left Bisbee at 10 p. m., not knowing the roads and with meager directions, headed for Huachuca via Hereford. We reached Hereford about midnight and could not locate a road out the way we had been told to go; after running 20 miles out on a wrong road and being near the Mexican border with the Mexican revolution in full sway, we were afraid of getting into Mexico and being picked up, so remained at Hereford until morning. From Hereford to Huachuca is 19 miles; the roads are fine, but some small washes prevent making good time. From Huachuca



SAN MIGUEL HILL, N. M., AND THE TUCSON-PHOENIX ROAD IN ARIZONA



CROSSING THE GILA RIVER AT DOME AND THE COLORADO RIVER AT YUMA

to Empire Ranch, about 30 miles, is fair running.

Leaving Empire ranch, we ran through National reserve, a state motor road built up over the mountains, winding around, with about 6 per cent grade and for 18 miles, and as good road as found anywhere. We arrived at Tucson that evening. We had to stay here 24 hours on account of very heavy rains and the road being osier and adobe formation, we were advised not to make the start when we did.

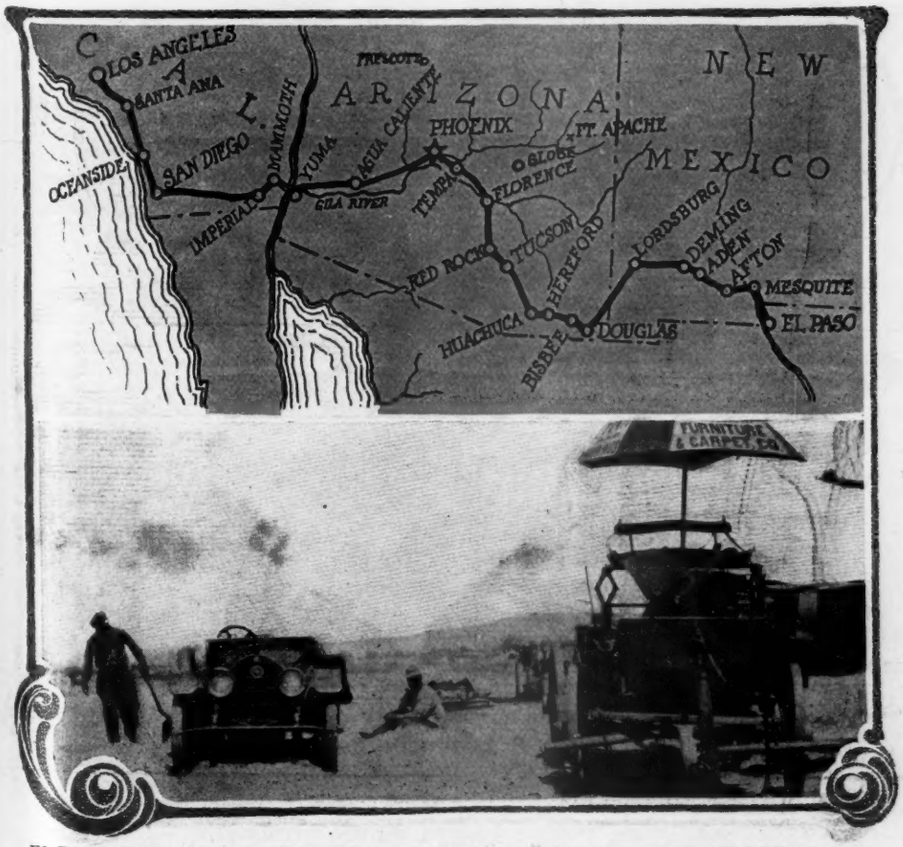
Tucson is on the broad prairie, is a pretty little city with pretty houses and splendid climate, good streets and roads. A state highway has recently been completed to Florence, which makes traveling easy. Leaving Tucson, we followed the old road to Florence via Red Rock, running through mud and water up to the hubs; this we had clear into Phoenix. Up to this time we had no accidents of any kind, no repairs whatever, not even a puncture.

Phoenix is a beautiful city with paved streets and fine country roads, in which the farmer has taken interest and after a rain one can see numerous drays in all directions. This valley is irrigated under the Roosevelt dam and everything produced in California is raised here, oranges, lemons, dates, etc. The elevation is 1080 feet. On every section division, is a road laid out north and south, east and west, all good, with shade trees on each side.

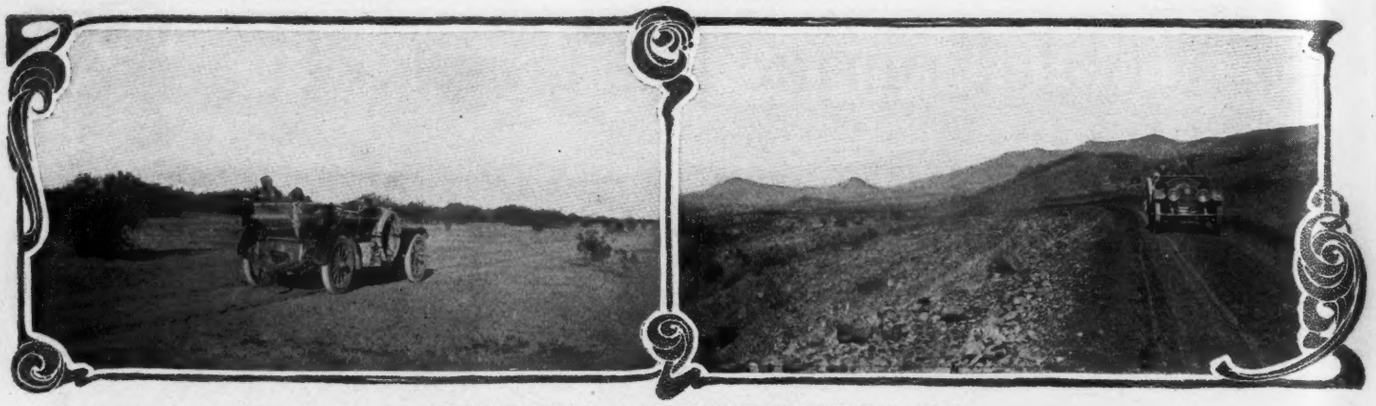
We left Phoenix at 1 p. m. and arrived at Agua Caliente, 103 miles, at 7 p. m., over fair roads and along the Gila river for several miles. Leaving there at 8 p. m. headed for Yuma, we broke a rear spring about 5 miles out and camped for the night. Leaving early we ran slow on this account, reaching the ferry over the Gila river at Dome, about 4 p. m. We blew out the front casing about 30 miles out of Dome, climbing a mountain gulch road. This was our first tire trouble, although we had used the tires over 4500 miles before starting. It took 2 hours to make the run between Dome and Yuma, about 20 miles, the roads being rough and rutty, then alkali bottom.

The old story of the man dying and going to Hades and sending back for his blankets is supposed to have originated in and applied to Yuma, as it is reputed to be the hottest place on the map of America; however, we found it very pleasant and cool. Upon arrival at Yuma, I received a message with sad news which necessitated my taking the first train for Los Angeles. After ariving at Ocean Park, I was informed by several parties, who had undertaken the trip across the desert, to ship my car from Yuma to Banning. I wired my son to do so, but his reply was that they wanted to make the run; furthermore the railroad company wanted $49.00 to ship the car about 60 miles. They came across the desert and went south to Imperial City, from Mammoth thence to San Diego and up the coast road to Los Angeles, arriving at Ocean Park April 21st, at 10 a. m., the speedometer showing 1300.2 miles.

The return trip was made by the same route, leaving Ocean Park, May 6th, arriving at El Paso, May 13th; actual running time 4 days and speedometer reading 1108.2




EL PASO, TEX., TO LOS ANGELES, CAL.; THE DESERT SAND ROAD AT GLOMIS, CAL.



THE STATE ROAD AT FLORENCE AND TUCSON, ARIZ.

miles. Business rushed my return and made the trip hard, otherwise, considering the distance traveled, the roads are good and the trip very pleasant, outside of the strip across the sandy desert. We rode the ties on the railroad track for 2 miles, crossing two bridges and one switch. Across the desert is mostly low-gear work and stopping to cool the engine.

Gasoline, oils and water can be gotten all along the route within short runs. The roads through New Mexico and Arizona are very good and especially so in Arizona. A pretty part of the trip is over the San Diego mountains, where one climbs for hours and then down to Imperial Valley, where one goes 160 feet below sea level.

The Borderland route via El Paso, Deming, Douglas, Phoenix, to Los Angeles is unquestionably the only spring, fall and winter route; however, I would not advise any one to make this trip west of Phoenix during the summer months and attempt crossing the desert.—W. T. Rand.

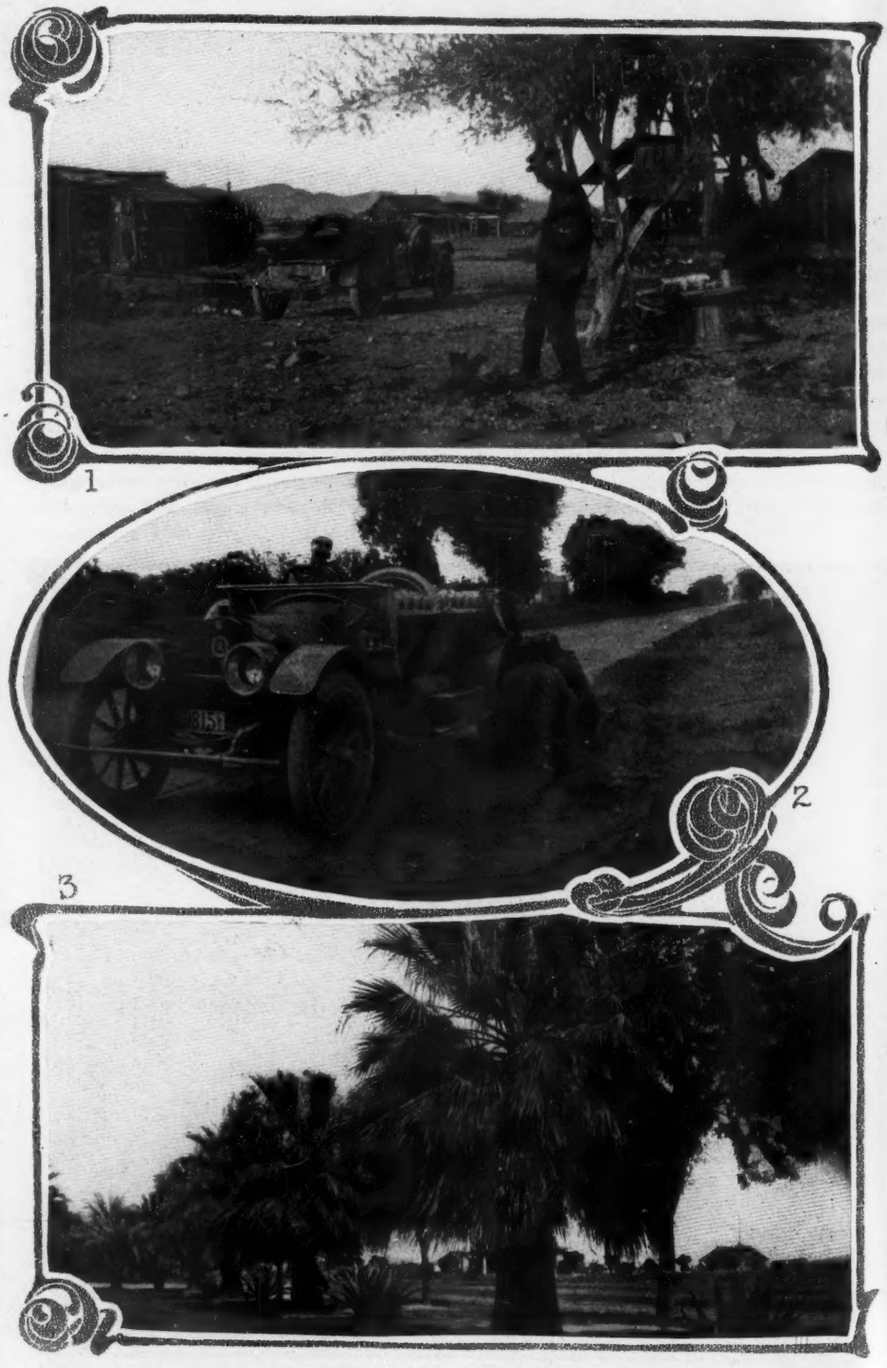
**KANSAS TO ILLINOIS**

Soloman, Kas.—Editor Motor Age—I would like to have a route given for trip by motor car from here to Princton, Ind., by way of Kansas City and St. Louis. Does Motor Age know if this road is marked or not?—R. J. Havener.

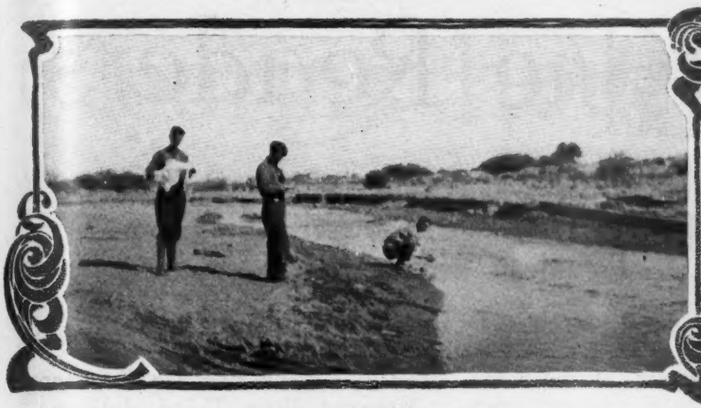
As Soloman is on the Golden Belt route you should go east through Abilene, Junction City, Fort Riley, Manhattan, Wamego, St. Mary, Topeka, Perry Station, Lawrence, De Sota, Bonner Spring Station, to Kansas City. From this point you will follow the Sante Fe trail through Independence, Levasy, Wellington, Lexington, Waverly, Malta Bend and Marshall to Boonville. Here your route becomes, or is known as, the Boon Lick road. Crossing the river to Old Franklin, then passing through New Franklin, Columbia, Fulton, Williamsburg, Danville, Warrentown, Wright City, Colterville, Wellston to St. Louis.

Crossing Illinois a distance of 156 miles, you will reach Vincennes, Ind. In dry weather the roads are fairly good, routing through Belleville, Shiloh, Lebanon, Trenton, Aviston, Breeze, Carlyle, Clinton, Salem, Zenia, Flora, Noble, Olney and Lawrenceville.

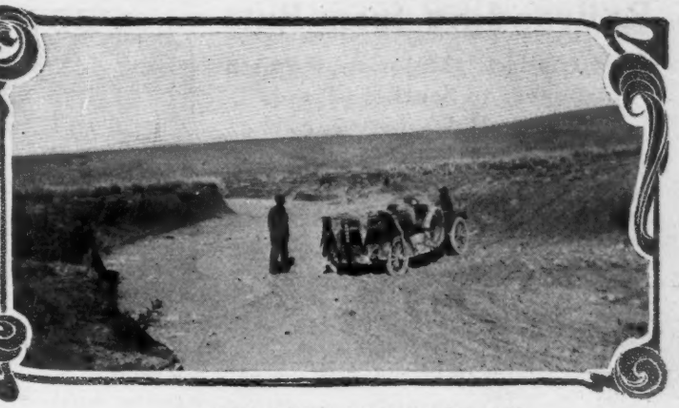
Princeton is 26 miles south of Vincennes and the best roads lead through St.



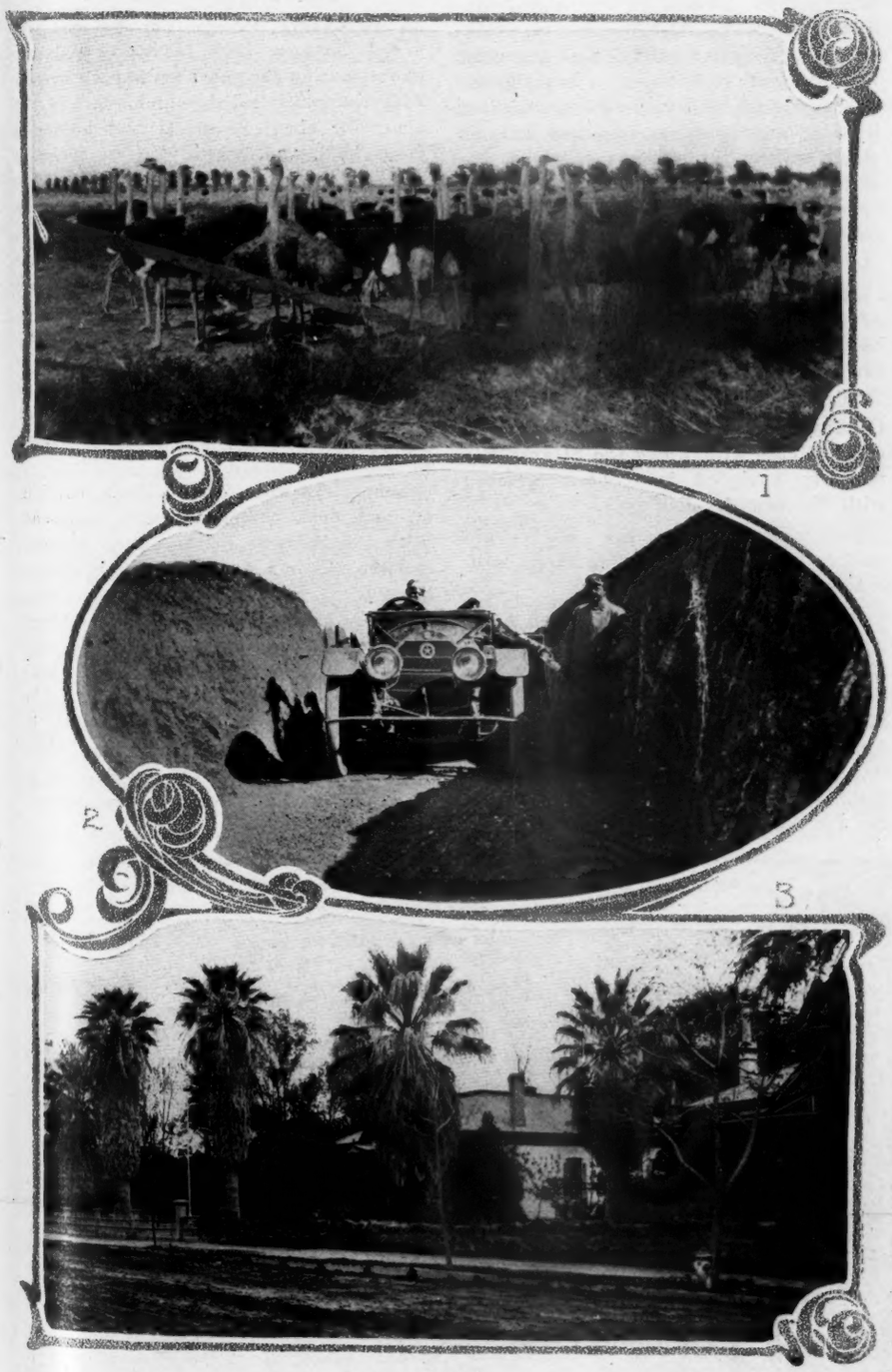
1—DEEP WELLS NEAR YUMA, ARIZ. 2—ON THE PHOENIX-YUMA ROAD. 3—AT PHOENIX, ARIZ.



NEAR PHOENIX, ARIZ.



APPROACHING HEREFORD, ARIZ.



1—OSTRICH FARM AT PHOENIX. 2—ANOT HER VIEW OF THE ARIZONA STATE ROAD NEAR TUCSON. 3—RESIDENTIAL SECTION OF TUCSON

Thomas, Hazelton and Patoka. This road is good with the exception of after a heavy rain, when one or two stretches of dirt road may be bad. However, it is mostly gravel or macadam.

While at Princeton we would suggest a run to French Lick Springs.

## UTAH CLUB PROGRESSIVE

In order to help tourists who are crossing the country, the Automobile Club of Utah has opened a free bureau of information at 251 South State street, Salt Lake City, Utah. Here a register is kept of all cars passing through the city and a system of route cards and maps giving road information in all directions.

Tourists are handed cards and asked to write back to the club giving road conditions and information for others following. By this system the club is able at all times to give the information on the roads.

## CORRECTS MISSOURI ROUTE

Chicago—Editor Motor Age—I notice in Motor Age of August 22 a route from Joplin to Sedalia. Having made the run from Chicago to Joplin a number of times, I would recommend as the best route between Joplin and Sedalia, which is a distance of about 190 miles by way of Carthage, Jasper, Lama, and Nevada, to which point there is a gravel road all the way from Joplin, a distance of 70 miles. Continuing to Shell City you strike poor roads and have to cross the Osage river bottom which is negotiable in ordinary weather. In this connection, if the road which Motor Age suggests via Nevada is taken a bad swamp has to be crossed, and if by way of Pittsburgh, Kans., going north to Kansas City on the Kansas side the swamp is also met with, so that no matter which way is chosen, the swamp is encountered. From Shell City the procedure lies through Appleton City, Clinton, Windsor and Sedalia. From my experience this is the best way from Joplin to Sedalia.

By no means go via Springfield. The road is good from Joplin to Springfield, but after that it is almost impassable by reason of there being nothing but natural roads, very rough, very rocky, and an innumerable amount of fords, one or two of which might require a block and tackle.

# The Readers

## Southener Tells How to Cope with the Hog-Back Roads—Merits of Dry-Plate Clutches—Owner Has Transmission Troubles Resulting from Neglect

## Railroading from Ruts

### A Mississippi Motorist Advises Strangers to Southern Roads as to Releasing Car

PORT GIBSON, MISS.—Editor Motor Age—I feel that I may offer the following, believing that many may be helped out in bad places. I do not know that others have not tried the same plan but I have not heard of them, and I have used it often and always with success. It is a way to help your car out of the ditch especially when there are high banks across the ditch.

In this part of the country there are many deep cuts that have been made by nature and water, and the roads go down these cuts, which are similar to railroad cuts. Often the road is narrow, hog-backed and slippery, and before you can think you find your wheels in the ditch, and your fenders against the bank on other side of ditch. To put on power and go ahead will ruin the fenders and not help you out of the ditch in the least. And nearly always the middle of the road where the other wheels are is of hard clay. I railroad my car out in the following way:

Take a hatchet or spade and dig a trench about the width of the tire from a point in front of the wheels on solid ground at a slight angle away from the ditch into which other wheels are, then cut into the bank enough to free the fenders or other parts of the car that may be touching, then put on the power and nearly every time the car will come out.

I have, on several occasions, had my car across the road with the front wheel in one ditch and the rear in the ditch on the opposite side of the road and by the use of these ditches and a jack gotten it out without outside assistance. Since the national reliability or Glidden is to tour Mississippi I thought these suggestions might be a help to some unfortunate.

To assist in understanding I have made a few sketches, Figs. 1, 2 and 3 showing the steps in the operation.—L. Briscoe Allen.

### STATUS OF DRY-DISK CLUTCH

St. Louis, Mo.—Editor Motor Age—Will Motor Age advise me how multiple-disk, dry-plate clutches, consisting of steel disks and non-burn disks, compare to those of the multiple-disk running in oil?

2—Would not there be a tendency of the dry plates to wear more rapidly than those that run in oil?

3—Have the dry disks that I have mentioned been used successfully by any manufacturer?—Subscriber.

1—The advantages of dry-disk clutches as urged by the growing number of users of this type are the positiveness and ease of engagement of the multiple disk, superior facility of disengagement, absence of grab, simplicity, ease of adjustment, smaller spring pressure required, and fool-proof qualities. The theory is that, like the multiple disk, the dry-disk clutch has a greater surface than the cone, and therefore is softer in action and more positive in grip than the cone expansion and kindred types. The most popular type consists of the regular multiple-disk assembly, with alternate disks faced with raybestos. This material will resist wear without heating, and possesses excellent friction qualities. By the elimination of oil, the clutch is made fool and trouble proof, it being necessary to wash it out with kerosene once a month. Disalignment if not excessive is not serious with this type.

Dry-disk clutches have been run as much as 50,000 miles without replacements, it is claimed, which speaks well for the wearing qualities of this type.

The local branch of the F. B. Stearns Co. reports that 80 per cent of the wet-disk clutches with which the Stearns was formerly equipped have been replaced with the new dry-disk type.

2—Dry-plate multiple-disk clutches are used by the following manufacturers with evident success:

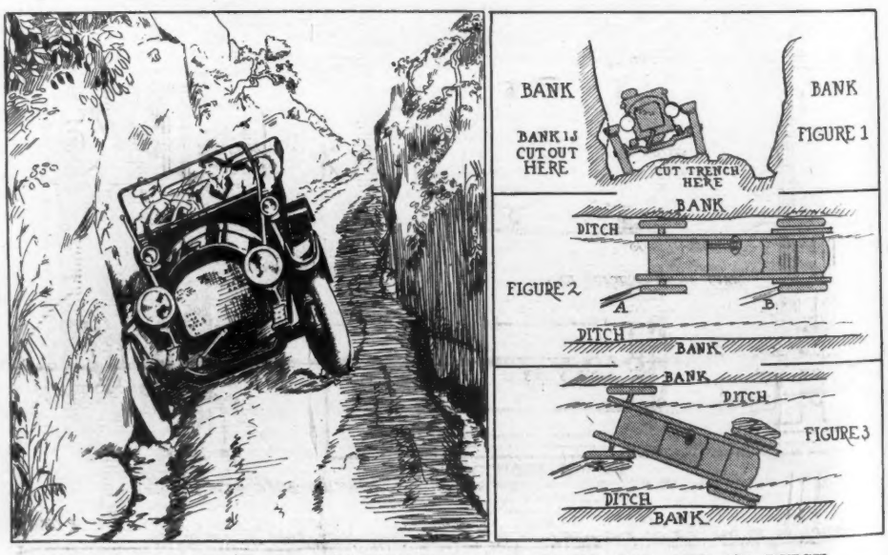
Packard Motor Car Co., American Automobile Mfg. Co., Velie Motor Vehicle Co., Simplex Motor Car Co., Dorris Motor Car Co., Selden Motor Vehicle Co., F. B. Stearns Co., Palmer and Singer Mfg. Co., Alpena Motor Car Co., Auburn Automobile Co., Clarke-Carter Automobile Co., Henry Motor Car Co., Knox Automobile Co., and the Atlas Motor Car Co.

## Clutch Needs Cleaning

### Savage Clutch Puzzles Keystone Motorist Who Tried Adjustments, But No Oil

AVONMORE, PA.—Editor Motor Age—I have a 1909 Maxwell 30-horsepower touring car and I am having trouble with the multiple-disk clutch. It will run along for about 25 or 30 feet before it takes hold, and, when it does, it grabs quickly, jerking the car. I have had this clutch out, adjusted it in every possible way, but it seems impossible to get it to engage properly. Please advise me what to do with it. I never have drawn the oil out of it or used carbon oil on it. Possibly, this would make it engage easier. In changing the speeds it is impossible to pick it up, for when it takes hold so quickly, it kills the power. Please advise me how to remedy this evil.—Constant Reader.

Your disks are glazed. Drain out the oil and flush thoroughly with kerosene. With the kerosene in the clutch housing, run the motor a few moments, operating the clutch, as the glaze on your clutch probably has become very hard through long neglect. After this drain out the kerosene thoroughly and replenish with new oil. Multiple-disk clutches should be flushed with kerosene once a month in ordinary running, which will keep them in prime condition and prevent damage to the other parts of the car through savage action and slipping.




FIGS. 1, 2 AND 3—ALLEN'S METHOD OF GETTING CAR OUT OF DITCH

# Clearing House

## Why Carbureters Catch Fire and Methods of Prevention—Fears of Austrailian for Magneto Without Grounds—Three-Wire System Explained—Bosch System

## Treating Carbureter Fires

### Kentuckian Fears Effect of Carbureter Fires - Methods of Extinguishing Them

TRENTON, KY.—Editor Motor Age—I have heard of several instances where cars catch fire in the carbureter and are burned. Why do carbureters catch fire?

2—How can this be best prevented?

3—What should I do in case of fire?

1—Fire in the carbureter is caused by the motor back-firing into the mixing chamber. This seldom causes the carbureter to actually catch fire, the live flame usually spitting from the air intake. A greasy or flooded carbureter is more likely to burn in this manner than is one which is kept clean. A fire in the carbureter can do much harm by burning the cork float, and the gasoline in the float chamber, which would be replenished by the float-feed mechanism as fast as burned; the destruction of the float, and the melting of the soldered connections, resulting in a dangerous conflagration unless steps be taken to prevent it. If a flame-destroying coil is not provided in the supply pipe, the fire may even reach the gasoline tank, and explode it.

2—Such a fire can be prevented by adjusting the inlet valves or regrinding them, so as to preclude the possibility of a back-fire through the carbureter, except under mishandling of the throttle, viz., too sudden acceleration. The danger from a back fire may be minimized by keeping the gasoline level sufficiently low to prevent flooding, and frequently swabbing off the carbureter surface. No carbureter should be applied without a flame-destroyer, which consists of a coil in the feed pipe through which flame will not pass.

3—In case of such a fire, the gasoline should be turned off at the tank, and the burning parts treated with a good fire extinguisher or smothered with sand or mud. Such a fire would take place on the metal and incombustible parts of a car, and if the fuel is shut off, little damage can ensue except to the solder, and to the float if it be of cork.

### OVERHEATING MAGNETOS

Cobargo, N. S. W., Australia.—Editor Motor Age—How much heat will a magneto endure? In my air-cooled Metz the magneto is bolted to the crankcase and, to the touch, gets very hot when on the road.

2—Are there any instances of overheating of the magnetos through faulty position?

3—Is not the armature insulated with wax?—Dr. H. Lister.

1—There is no danger of overheating the magneto on a gasoline motor.

2—There are instances where the placing of a magneto too close to the exhaust pipe, especially on motorcycles, has caused the burning of the lubrication of the timer and bearings, but none to our knowledge wherein the windings or insulation have been affected.

3—The armature of a magneto is insulated with wax and varnished.

The varnish will stand all the heat the engine will produce. If magnetos were susceptible to overheating, they would not be used as they are for racing.

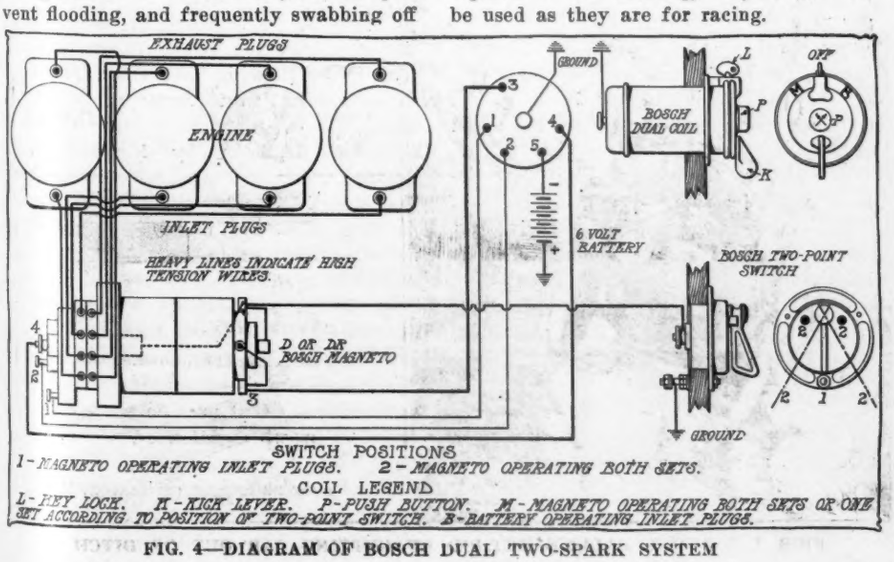



FIG. 4—DIAGRAM OF BOSCH DUAL TWO-SPARK SYSTEM

## The Three-Wire System

### Reader Is Curious About Rumored Innovation in Kissel Electric Arrangements

ALBANY, N. Y.—Editor Motor Age—What is the Edison three-wire system as will be used on the Kisselkars, and of what advantages is it?

2—Does the Bosch Magneto Co. install two ignition switches, one independent of the other for the dual multi-point ignition, as used on the double distributor magnetos? If so, would like an explanation and diagram of the wiring in detail so that all currents may be traced. Also does the manufacturer who installs this system make all connections the same?

3—When starting a motor with a Bosch dual ignition, the switch is turned to the battery and the arrow on the push-button turned to the position marked Start on the face of the switch, and when switched to the magneto the arrow on the button points to the position marked Run. What influence on the ignition has the turning if this push-button?—John Bastian.

1—The Kisselkar announcement for 1913 has not yet been made, although it is generally understood that the three-wire system of ignition will be used in the new models. This system, as usually employed consists of a form of wiring wherein the total voltage is conducted from the current source by means of two outside wires positive and negative respectively, between which a neutral wire is connected to the current source so as to conduct but half the voltage of the outside circuit. Thus, in a battery of six cells, having a total voltage of 12 volts, across the outside wires, the neutral wire is connected between the two sets of three, wired in series, giving 6 volts across the neutral wire and either of the outside wires.

2—The Bosch two-spark dual system includes two switches, one a two-point kick switch, the other the switch of a Bosch dual coil. The system is illustrated in Fig 4. As is shown in the legend, the manipulation of these switches permits sparking on one set of plugs on either magneto or battery, on both sets of plugs on magneto. For proper running, the connections should always be as designated by the manufacturer of the system.

3—The purpose of the push-button on the Bosch dual coil is to cut out the vibrator on the coil when in run position, the current being broken only by the interrupter, while in the starting position the current is broken by the vibrator, which produces a very large and intense battery spark, ideal for starting, but having too much lag for running, hence being cut out when the motor starts. The new system consists of a turning button, instead of the former push-button, the turning being for the purpose of locking it in starting position.

# Small French Motors of High Power

## Reader Explains How Great Speed Is Obtained from Little Foreign Engines—Question of Efficiency—Road and Air Resistance—Underslung Rights

INDIANAPOLIS, IND.—Editor Motor Age—I beg to add in the Readers Clearing House a few words to the replies to the questions of J. N. Brightwell, of Atlanta, Ga., issue August 1, 1912, page 27.

His first question asks how some of the French motors of small size have been made to develop exceedingly high horsepower. The answer in a nutshell is large gas passages and valves, and light reciprocating parts, and perfect balance. The former gets the power, the latter enables the motor to endure such power. Right here I will say the English have been far more successful than the French, especially in getting endurance with speed, and all because of practice on Brooklands track. A few instances: Sunbeam has a four-cylinder, 3.15 by 4.73 inch motor, 148 cubic inches developing 58 horsepower at 2,400 revolutions per minute; valves are 1.9 inch in diameter; lift ½ inch; weight of piston 1 pound 7 ounces.

Singer has a four-cylinder, 3.15-inch by 5.12-inch motor, 160 cubic inches, developing 66 horsepower at 3,000 revolutions per minute; valves are 1¾ inch intake; 1⅝ inch exhaust; lift ⅜ inch; weight of piston 1 pound; connecting rod 1½ pound.

Austin has a four-cylinder, 3.5 by 4.5 inch motor, 175 cubic inches developing 72 horsepower at 3,000 revolutions per minute; valves are 2 inches in diameter; lift ½ inch; weight of piston 1 pound; connecting rod 1½ pound.

Vauxhall has a four-cylinder, 3.54 inch by 4.73 inch, 184 cubic inches developing 83 horsepower at 3,000 revolutions per minute; valves 2 inches; lift ½ inch.

Chas. Faroux, editor of L'Auto and a French consulting automobile engineer, worked up a four-cylinder motor of 3.15-inch by 5.12-inch size, 160 cubic inches, to develop 78 horsepower at 3,300 revolutions per minute; valves 2⅞ inches diameter; lift 0.4 inch.

Large and high-lift valves mean large manifolds in order to get the advantage of them, 1¾-inch inside diameter, intakes being used.

Of course these motors have good clearance, the difference in diameters of piston and cylinder being about 15/1000 inch and they use two-spark ignition of course. But they are not extremely high-compression motors, a compression ratio of about 1 in 5 being mostly used and although the valves raise quickly and close quickly, 150 to 200 pounds per inch valve springs being used. The extreme timing used to get peak of horsepower curve to come as high as 2,100 to 2,200 revolutions per minute on the small-valve American racing motors is found not necessary on these motors. In fact the time all runs close to the following: Exhaust open 36 degrees before bottom; close at top to 90 after. Intake open at top to 12 degrees after, and close 27 degrees after bottom. This conservative timing means that the motor will idle slowly, the speed range of Austin motor mentioned above being from 140 revolutions per minutes to 5,000 revolutions per minutes, peak of horsepower curve at 3,000 revolutions per minute.

Secondly, Mr. Brightwell asks why a high-powered car is not as efficient as a low-powered car, pointing out that almost any stripped stock car can do 60 miles per hour while a 90 horsepower car is hardly able to show over 80 to 85 miles per hour. Motor Age mentions wind resistance and there hit the nail on the head. Weight is a factor in maximum speed on the level as regards acceleration only, that is, getting up speed. Of course, in hill-climbing weight is of more importance and you will note more of a difference in the hill-climbing performance of low and high-powered cars than in maximum speeds on the level. In the first place, in answering Mr. Brightwell the high-powered car is as efficient as the low-powered one. Friction and road resistance horsepower is very small, being about 9 horsepower at 70 miles per hour for the average American race car and 7 horsepower at 70 miles per hour for the average car raced on Brooklands, and varying directly with the speed. The main article to contend with is wind resistance, average horsepower to overcome which for average American flat-front, two-passenger race car is about 31 horsepower at 70 miles per hour and about 25 horsepower for the pointed front one-passenger cars as used on Brooklands at 70 miles per hour and varies as the cube of the speed of the car.

In fact two formulas which I have derived will illustrate.

P = horsepower required to drive car.

S = speed in miles per hour car is to be driven.

For American flat-front two-passenger race cars

$$P = \frac{1.33S}{10} + 0.00009S^3$$

For English stream-line one-passenger race cars, also light in weight,

$$P = \frac{S}{10} + 0.000073S^3$$

The first term is the horsepower to overcome friction and road resistance and is smaller than what most people consider it to be but I can prove that I am correct. The second is the horsepower to overcome wind resistance at ordinary atmosphere pressures and on a calm day.

A few examples:

The Sunbeam car mentioned above has a flying ½-mile record on Brooklands track of 87.3 miles per hour. Singer, the same at 90.04 miles per hour. Austin, the same at 93.79 miles per hour. Vauxhall, the same at 100.04 miles per hour.

In America the stock-sized National four-cylinder 4⅞ inch by 6 inch motor, 447 cubic inches, developing 113 horsepower at 2,000 revolutions per minute; valves 3 inches in diameter; lift ½ inch; can show 104 miles per hour.

The Blitzen Benz four-cylinder, 7.29 inch by 7.87 inch, 1,310 cubic inches, developing 225 horsepower at 1,575 revolutions per minute, has a flying mile record stream-line body at 141.7 miles per hour.

It is easier to get at foreign data, for those on the other side of the water have been doing so very much experimenting. —A. L. Sheridan.

### UNDERSLUNG RIGHTS

Des Moines, Ia.—Editor Motor Age.—What company owns the underslung frame patent?

2—Under what right can the Regal and Colby use this frame?

3—Is there any concern which makes demountable rims which can be attached to the ordinary clincher rim without much alterations?

4—What is the estimated output of cars for 1912?—M. J. Probert.

1—There is no underslung frame patent, as there is nothing patentable in the idea. Inverting the frame involves a number of dynamical differences in the manner of suspension, but changes in no way the principle of suspension of the chassis members from the axles. The underslung idea is not new in mechanics, but only in its application to motor car construction.

2—The Regal, Colby, Norwalk, Krit, Omaha, and about nine other motor cars that have in recent years adopted the underslung idea, are under no other than moral obligations to its originators, the American Motors Co., for its use. It has been predicted repeatedly by this latter concern that this type of suspension would eventually become standard.

3—There are no demountable rims now on the market that may be applied to the felloe of a wheel intended for clincher rims, without alterations.

4—As near as can be estimated, the output of motor cars for the year 1912 will probably reach over 220,000 cars.

# Charging the Batteries With a Windmill

## Method of Recharging Accumulators by Wind Power—Economy of Tungsten Lamps—Factory Tests of the Cars—Voltage of Bosch Magneto

MAYVILLE, N. D.—Editor Motor Age—Is it possible to use a windmill to run a dynamo to charge storage batteries for electric lighting and use a gasoline engine in case of emergency?

2—Must a dynamo run at one certain speed to charge storage batteries?

3—What kind of mechanism is used on the Cadillac to cut off current from the dynamo when the battery is fully charged and what is it that puts it on again?

4—What makes the tungsten electric lamps take less current than carbon filament lamps?

5—How do engine factories test each part of their engines to find out if any part is defective?

6—Does it take more power to run a dynamo to charge batteries than you would get power from an electric motor run by storage batteries?—A Subscriber.

1—A windmill preperly applied to a direct-current dynamo can be used to charge batteries. Some form of cut-out or governor will have to be used to prevent overcharge in case of a strong wind, or leakage back through the dynamo from the battery in case of a lull. Many dynamos are equipped with such devices. Those that are not should be provided with a suiable fuse to prevent overload of current, and a magnetic switch to break the circuit if the production of the dynamo falls below a certain minimum, at which the direction of flow of the current would be reversed.

2—A dynamo need not run at a constant speed to charge batteries, although it must keep between certain limits as explained above.

3—The Delco system, used in the 1912 Cadillac, prevents overcharge and recharges by means of a controller which through an automatic cut-out allows the batteries to be charged up to a certain limit, when it automatically cuts them out of the dynamo circuit, making the contact again when the charge falls below a certain minimum.

4—To understand the economy of the tungsten, it is first necessary to recall the principle upon which all incandescent electric lights work. Certain metals have more resistance to the passage of an electric current than others, for a given size and quantity. Also of metals possessing the same resistance, some will be acted upon differently by the passage of a current of electricity through them. Thus in an electric light bulb, the filament consists of a fine wire of carbon or tungsten steel, which, owing to its size and composition, offers resistance to electric currents. This resistance to the current causes the delicate wire to become hot. In a vacuum, this heat, due to the lessened radiation in the rarified atmosphere about it, becomes very intense, yielding a white light. Now, given a certain resistance and consumption, some metals are more affected by this friction than others. Thus a wire of high carbon steel will become hotter under the influence of a strong electrical passage than will one with a lower percentage of carbon. In exactly the same way it has been found that, offering no more resistance to the passage of a current of a certain intensity, its consumption being therefore no greater, a filament of tungsten steel would become hotter, thus giving off a brighter light than a carbon filament of corresponding resistance.

5—There are a great many tests applied by different factories to check up the same part of a motor car, and many tests performed by each manufacturer for the many parts of a motor car. To attempt to enumerate them would be folly. In a general way, however, the tests may be classified as follows: Micrometer measurements, wherein each finished part is inspected and measured for size, in the best practice to as narrow limits of tolerance as 1/3000 inch, i. e.—parts to be passed must be within 1/3000 of an inch to the measurement specified, before they will be passed. Physical tests which are confined mainly to the testing of the strength and endurance of the materials which go into the make-up of the car. These consist of the subjection of samples to breaking, bending, twisting, and tensile strains, to vibration, heat, and impact, and to cutting and friction. Chemical tests, which embrace chemical analysis and laboratory tests and experiments. Jig and templet tests, to determine the fit of component parts, which is mainly confined to process of manufacture as distinguished from tests subsequent to completion. Manual tests, such as the rapping of castings, inspection for flaws and defects not of material nor measurement. And practical tests, such as actual running of the parts, and their adjustment, motor tests on the block and brake, dynamometer tests, and road tests.

6—Due to the friction of parts and the electrical leakage and inefficiency of the generator, it takes more power to run a dynamo than it will produce in the form of electrical energy. In the same way, owing to the loss in electrical transmission and the inefficiency of the storage battery, as well as the omnipresent electrical leakage, no battery will receive the full power generated by a dynamo. Further, no motor will use the full amount of current conducted to it from a storage battery or any other source or reservoir of electrical energy, because of loss in electrical transmission, and the inefficiency of the motor, and as before, to electrical leakage. And lastly, no motor can convert the full amount of current it uses into power. In short these devices are only to a limited extent efficient or economical, and however near their efficiency may approach 100 per cent, it can never reach it, for there is no perfection in nature. If dynamos, motors and storage accumulators were 100 per cent efficient, we would have perpetual motion; until that time, however, such ideas as getting as much out of a mechanical appliance as is put into it, or in other words, the total elimination of all waste, will be beyond the practical.

### BOSCH MAGNETO VOLTAGE

Wimbleton, N. D.—Editor Motor Age—Please tell me through the columns of the Readers' Clearing House what voltage the Bosch high-tension magneto is capable of generating.—Magneto.

Bozeman, Mont.—Editor Motor Age—In the Readers' Clearing House columns will Motor Age state the average voltage of the ignition current at sparking points from a modern spark coil and from a Bosch high-tension magneto?—W. T. Lovell.

It is impossible to give definite figures of voltage, but it generally ranges from 10,000 to 15,000 volts. With a Bosch D4 instrument at 300 revolutions per minute the voltage is approximately 10,000, and if this magneto speed is doubled the voltage will increase perhaps 10 per cent. Voltage always increases with an increase in speed and lowers when the speed is reduced. With this voltage the amount of current flowing or the amperage is less than .5 ampere, this instrument being essentially a low-amperage one.

With high-tension magnetos the current generated is short-circuited at a predetermined point, the resulting discharge of pent-up current is through the secondary winding, a fact which makes it hard to give maximum voltages and amperage as this depends on rapidity of rotation and magnet strength. In measuring voltage the spark gap is used, the standard of measurement being the distance the spark will bridge the gap.

With the ignition coil and battery both voltage and amperage depend on the battery and the coil. If you have a strong battery and a large coil you will get as high as 15,000 volts and the current consumption may be 3.5 amperes. It is general with spark coils to give voltages from 12,000 to 15,000 with a current consumption of 2.5 to 3.5 amperes.

# Carpenter Explains a Motor Jerk

## Mysterious Irregularity Traced to Carbureter—Benzine Sometimes Adapted to Use in Gasoline Motors

SAUK, CENTER, MINN.—Editor Motor Age—When visiting with a friend who owned a motor car he asked me if I could tell him why the motor would jerk when it first started off, and as soon as it speeded up it would run fine, although it would stagger and jerk at times even on the high gear. As I had been a driver of cars for a long time I must now face this request and find the real cause of this condition or be called a poor mechanic.

The car was in fine order, and after going over the places where this trouble was likely to be and not finding the cause of this jerk and jump motion of which he spoke I concluded to try the car on the road to see from personal observation how it acted in order to promptly find the true cause and remedy it. I cranked the motor and it would not respond. I then primed it with gasoline and the third turn of the crank it went, but soon it settled down into the jerk-and-vibrate class and finally made several spasmodic efforts and stopped. I repeated my priming and was rewarded by a prompt reply. I got into the car and advancing both throttle and spark got out of the garage and into the road, but that was about all. At the moment I went into high gear the car made a few jumps and staggers and subsided. Now I was into it truly and tried to get it to go but go it would not. By dint of trying I succeeded in getting the motor started again and limped back into the yard and got into the garage somehow.

I learned the cause of the trouble, if I did get laughed at for my pains. The carbureter was the seat of war, so to speak. I cut off the gasoline at the tank, uncoupled the pipe to the carbureter and unbolted the connection at the intake pipe and took out the carbureter. I got the cork float out and it looked all right, so I replaced it for the test. I stopped up the inlet pipe hole and poured in gasoline until it was level with the spraying nozzle, first fastening the bottom of the carbureter where it was perfectly level. Then I took off the top of the carbureter so I could see the position of the float when the gasoline was at the right height for perfect work, and was not surprised to see the float had got water-logged or soaked with water and oil and dirt, in some way, and hung down so it did not allow the gasoline valve to work properly. It would let in too much gasoline at one time and not enough at another, hence the jerking of the motor when called upon to work and running for a little time alright. I again took out the float and dried it over a stove; then I carefully cut some shellac with wood alcohol and with a fine brush carefully covered the whole of the cork, then allowed it to dry thoroughly before I replaced it. I then took a look at the gauze brass which is to keep out all small particles of dirt and foreign matter, and right here was a help to the real cause of the trouble. A piece of lint about as large as a small pea had got into the gasoline and floated down with it until finally was stopped by the strainer gauze. Here it acted in part as an obstruction to the free regular flow of the gasoline to the spraying nozzle, for the harder the cylinders would suck for the mixture the tighter this little piece of lint would hug up against the brass gauze, greatly hindering the proper amount of gasoline from entering the carbureter.

I washed the carbureter out with boiling hot water and then dried it so as to not have any moisture in it. Then I assembled and replaced in its position, opened the supply tank cock and carefully adjusted the gasoline supply valve to float. I now turned the switch and without priming the motor she started at the first quarter uppull of the crank, and a purr with the throttle down to almost nothing was my reward. And would it jerk any more? Not a bit.

My friend was so delighted that he wanted me to accept a $10 bill for the job, but as I am not in the repair business I declined, with thanks. He says he now knows more about a carbureter than he ever dreamed of before, and that the advice of being careful to strain all the gasoline through a good chamois skin is being religiously adhered to. After a 6-months' use he says the motor is the easiest one he ever saw to start, hot or cold.—A. D. Carpenter.

### PACKARD REAR AXLE GEARS

Towson, Md—Editor Motor Age—What does the 30 bridge of the Packard figure? About 3.2 I think, and it is my understanding that it stands for 30 miles per hour at normal speeds and about 900 revolutions per minute. Is this possible?

A friend has a Packard six runabout and we have repeatedly gotten 70 out of it. The agent insists that it is a 30 bridge. I do not know what the ratio is. The six has not the bridge marked on the cover plates of the differential, but I am inclined nevertheless to believe that this model has a 30 bridge, as it picks up to 70 in ½ mile, and I never saw a more truly high-gear car before. But, if it is true that the motor must turn at 2,100 revolutions per minute, why cannot one get 70 or better from a stripped chassis. I have always believed that a four would turn over faster than a six-cylinder engine. Is this so?—C. Ridgely Emory.

The Packard 30 bridge, is the rear-axle assembly which is geared for 30 miles per hour at an engine speed of 600 revolutions per minute, using a 36-inch wheel, for the 30, and a 37-inch wheel for the six. The gear ratio in this axle is 3.2 to 1. All Packard cars have the bridge model stamped on the back of the housing. In some cases the coat of paint and varnish over this designation is so heavy as to obliterate it, but a little scratching will reveal it.

A 30 bridge on 36-inch wheels will move the car at 70 miles per hour at a motor speed of 1400 revolutions per minute.

On the six-cylinder cars, with 37-inch wheels the gear is 3.7 to 1, and with the 35 bridge, with which the six runabouts are regularly equipped, it is 2½ to 1.

Six-cylinder motors are usually made for slower speeds than fours, because their continuous torque renders them more flexible, and therefore less dependent upon speed for power than those of the four-cylinder type.

### BENZINE AS MOTOR FUEL

Hillsboro, O.—Editor Motor Age—Can the form of naptha called benzine be used in a motor car with the same results as gasoline?

2—Would the fuel consumption be greater? If so would benzine at 7 cents a gallon be cheaper than gasoline at 14 cents a gallon?

3—What is the test of gasoline and benzine?

4—Would benzine be more liable to foul the spark plugs and cause carbon to form than gasoline?

5—Does the Schacht Mfg. Co. still use the Buda engine in its 1912 four-cylinder models?—A Subscriber.

1—In experiments conducted by the Standard Oil Co. in Chicago, it was found that with the newer types of carbureters, benzine or naptha may be used in a gasoline motor car engine not with the same results, but with an increase in efficiency over gasoline. This applies of course to actual running. It was further learned, however, that owing to the fact that it is less volatile than gasoline, starting was extremely difficult in cold weather. And that good results could be obtained only from the use of a water-jacketed or otherwise warmed carbureter, and a hot-air intake.

Benzine may be used most advantageously in cold weather, if the motor is started and warmed on gasoline, the heavier fuel being introduced later. This may require some manipulation of the dash control, to allow for the relatively higher combustion efficiency of gasoline, which would probably necessitate a slightly thinner mixture for gasoline than benzine. Experiment, only, can determine this.

2—These tests showed that mile for mile, the fuel consumption is less, using benzine than gasoline. Thus benzine at 7 cents a gallon would be more than 200 per cent cheaper to use than gasoline at 14 cents a gallon in the same engine, if

provided with the proper type of carbureter.

3—Gasoline from the present western crude oils tests from 59 to 60, while benzine from the same source, tests about 57.

4—Benzine is not successful in all types of carbureters. In some it will carbonize, and in others it will not. In the newer types, the Standard Oil tests failed to reveal any increase in carbon deposits, over that resulting from the use of gasoline.

5—The Schacht models continue the use of the Buda motor.

### HUDSON MANUFACTURE

Omaha, Nebr.—Editor Motor Age—Please advise whether the Hudson 37 is what is commonly called an assembled car.

2—Was the 1912 model also the 1911 model? If not, to what extent does the Hudson Motor Co. manufacture its own parts?

3—Is not the Hudson model 37 motor identical with the C 4 Continental model?

4—Is the rear axle of the 37 designed and furnished by the Hyatt people?

5—Is the transmission of the 37 made and designed by the Warner Gear Co.?

6—Is the clutch of the 37 designed and made by the National Clutch Co.?—Old Subscriber.

1—The Hudson car, in as far as manufacture is concerned, is an entirely assembled car, although the designs are all made by the company's own staff of engineers, under the supervision of Howard E. Coffin.

2—There were minor changes and refinements embodied in the 1912 Hudson over the 1911 model.

3—The Hudson 37 motor is of original and exclusive design, but is made by the Continental company.

4—The rear axle of this car is of Hudson design, and made by the Detroit Metal Products Co., and uses Bower bearings.

5—The Hudson gearset is designed by the manufacturers, but is not made in the Hudson factory. The identity of the manufacturer cannot be ascertained.

6—The clutch is made by the National Clutch Co., but is of Hudson design.

### CEMENTS AND POLISHES

Parkston, S. D.—Editor Motor Age—Please give a formula for a good cement for pipe connections or spark plugs that will withstand high pressure or high heat.

2—Where can I obtain a polish for silvered electric reflectors?—E. G. Meisemhoelder.

1—A fireproof cement that becomes very hard when heated is prepared by mixing 180 parts of fine iron filings, forty-five parts of lime, and eight parts of common salt, and working the ingredients into a paste with strong vinegar. The cement must be perfectly air dried before heating.

2—Any silver polish, such as may be purchased at drug, department or grocery stores.

# How Speedometer Gears Are Figured

## Pennsylvania Compels Everyone to Take Out License Before Operating Cars—Plug Cement Formula

CROPSEY, Ill.—Editor Motor Age—What should be the correct number of teeth on the large gear of the Stewart speedometer, the small gear having 16 teeth and being used on 34 by 4 wheel?

2—The speedometer I am using on Model 17 Buick has 16 teeth on the small gear and 64 teeth on the large one. Is this correct?

3—How are these gear wheels figured for furnishing correct number of teeth to be used?

4—I have a friend who has a model 10 Buick and uses 30 by 3½-inch wheels. On his small gear there are 16 teeth and on the large gear there are 60 teeth. On running side by side at 20-mile rate, according to my speedometer, his speedometer registered a little better than 25 miles per hour, which is correct according to the gears and the size of the wheels we are using; or, are we both wrong?—D. E. Crum.

1—68 teeth.

2—No.

3—The proper number of teeth, for corresponding pitch, to the small pinion, which is almost universally of 16 teeth, is found by multiplying the inch diameter of the wheel by two. Hence a 34-inch wheel takes a 68-tooth large gear, a 40-inch wheel, takes an 80-tooth large gear, and a 32-inch wheel takes a 64-tooth large gear.

4—The error in gearing in your speedometer connections accounts for the difference in reading at the same speed between yours and your friend's speedometer. His gearing is correct.

### OWNERS MUST HAVE LICENSE

DuBois, Pa. — Editor Motor Age — Is there any case in the courts of Pennsylvania which would reverse the attorney general's conception of the law that everyone must have a license. As I understand the law, a car is licensed and any one may drive it without license, except he be a chauffeur. A chauffeur as I understand is one who receives money for driving.

2—Is there any device on the market which will fit over the nose and mouth for the purpose of filtering the dust from the air? My letter to the Sanitary Shield Co. of Richmond, Va., which address I saw in Motor Age of October, 1911, was returned.

3—So many questions have been asked for the difference in power of a long and short-stroke motors. What I would like to know is the hill-climbing ability of two cars both claiming the same horsepower yet of the long-stroke type and one of the short-stroke type.—W. J. Marlin.

1—According to a recent decision of the Pennsylvania state highway department, in future every person operating a motor vehicle will be compelled to take out a driver's license, regardless of ownership or membership in the owner's family.

2—Such a device is marketed by the Sanitary Sales Co., Box 1774, Bradford, Pa.

3—It is claimed by the advocates of the long-stroke motor that, due to the greater crank leverage and more rapid expansion of the gases during combustion made possible by the greater stroke-bore ratio of the long-stroke motor, greater power is obtained under severe loads than with a square or short-stroke type, although when running under normal conditions no difference in power is apparent in motors of the same displacement at the same piston speed. See Readers' Cleaning House, Motor Age, June 27th.

### SOME GARFORD QUESTIONS

Minneapolis, Minn.—Editor Motor Age—What are the four gear ratios and the reverse, also the rear axle gearing on the 1910 model G-7 Studebaker-Garford?

2—What is the highest number of revolutions per minute of the engine under ordinary circumstances?

3—How can I locate the trouble for an excessive amount of gasoline and how can I remedy it?

4—How many miles per gallon of gasoline should a seven-passenger car, loaded, of the above type make?

5—Where can I secure Garford catalog?

6—Where can I obtain a 1912 A. L. A. M. handbook of gasoline motor cars?—A Reader.

1—The Garford G-7 ratios are as follows: First, 1 to 3.41; second, 1 to 1.76; third, 1 to 1—direct drive; fourth, 1 to .86; reverse, 1 to 4.6; rear axle reduction, 3.4 to 1.

2—The normal speed of the motor is from 900 to 1,000 revolutions per minute.

3—Presuming that you mean an over-rich mixture, the remedy is to screw up the high-speed spring-adjusting nut to admit more air. Adjust the low-speed spring until the motor runs properly on low speed.

4—The average gasoline consumption of a G-7 car under normal load is claimed to be from 10 to 11½ miles to the gallon.

5—By writing to the Garford Co., Elyria, Ohio.

6—The Automobile Board of Trade, successors to the A. L. A. M., published a 1912 handbook of gasoline cars, which may be secured by writing to this association, 7 East Forty-second street, New York city.

# Manufacturers' Communications

## SEE DANGER IN OLDFIELD BILL

WAUPUN, Wis., Aug. 16—Editor Motor Age—Referring to your article on page 18 of your issue of August 15, I feel this Oldfield bill to be more important to the motor car accessory manufacturers than would appear from a perusal of the article, and we believe it would be of value to all who are in the accessory trade or market to make the following public:

Of vital importance to automobile accessory manufacturers, jobbers, and dealers is House bill number 23,417. According to Edward B. Moore, United States Commissioner of Patents, the passage of this measure will deprive any inventor or manufacturer of the right to control the re-sale of a patented article. As the distribution of nearly all the standard accessories is based on a system of price maintenance, it would seem therefore to behoove all interested parties to influence Congress against the passage of the measure. Manufacturers, jobbers, and dealers in other lines have sent their representatives to appear in person at the hearing before the Committee of Patents. They have also written appeals to their congressmen to carefully consider the consequences to their constituents of the passage of a bill of this sort.

It is probable that an attempt will be made to railroad this bill through, by the fact that it is attached to another measure prohibiting manufacturers from buying patents and burying them, making compulsory that they manufacture them within 4 years of the granting of the patent, in such quantities as to supply the demand, or forcing them to permit others to manufacture under the patent.

Thus far all that has been published in favor of the measure has apparently been an endeavor to show that the present law is for the good of no one but the manufacturer, and that its repeal would be of benefit to all others affected. An investigation from an unbiased standpoint will reveal, however, that it would work to the detriment of five classes, whose members make up about 95 per cent of the citizens of the entire country. In fact, it would seem that the only benefit would accrue to the unscrupulous cut-rate concerns and the mail-order houses.

The five classes are: 1 Manufacturers; 2 Jobbers and dealers; 3 Magazines, newspapers, and trade journals; 4 Inventors; 5 Consumers.

A patented article is necessarily a new device, and as such requires a great deal of publicity, before the consumer can become acquainted with its benefits to him, and be able to secure the article for his own use. The manufacturer sets a retail price at which all concerned in its production, distribution and sale, may enjoy a legitimate profit, allowing a sum for advertising, which is essential to its sale. It would be unfair indeed, if, having gone to the expense of creating a demand for the article, cut-rate concerns and mail-order houses could sell the same thing greatly below his price, having none of the advertising costs to pay, forcing him to either discontinue manufacture, or operate at a loss, as would be the case where he no longer protected from such unfair competition by law. The legitimate dealer and jobber would also be caught with a stock on hand, that to be moved would have to be sold at little or no profit.

From this it will be seen that national advertising campaigns of any magnitude would be prohibited. Local advertising would likewise lose its stimulous through the dealers' uncertainty of being able to dispose of his stock at his legitimate profit. This would mean the loss of merited revenue to all classes of periodicals.

The present laws are the bulwark which has protected the inventive genius of this country, and furthered its development to such an extent as to place America at the fore in mechanical development. Many geniuses are employed by manufacturing concerns to devote their energies to research. This monetary reward would be impossible were the law proposed to be enacted; and inventors would be forced to other pursuits with incalculable loss to the public.

The consumers would lose in the abandonment of the one price system, that today constitutes the fabric of honest merchandising, and while at times the consumer would be able to buy a patented article at a reduction, there would nevertheless be nothing to prevent a raise in price by a local dealer at any time. The result of such a possibility would be the freezing out of small dealers in large cities, by stringent price-competition, and unfair gains on the part of dealers having a monopoly of territory.

Theorists hold that by permitting a reduction in the retail price of patented goods, benefit is bound to accrue to the consumer. This would work out, however, as all economic questions do, to counteract reductions on goods on which money had been spent to enable the public to secure them, it would be imperative that at least a corresponding increase be made on unpatented, unadvertised goods.

To deprive inventors of their greatest incentive, a suitable monetary reward, would deprive the consumers of the fruits of their endeavor, and would retard mechanical development, placing it on the same unprogressive footing as prior to 1836, when the patent office was established, and which condition was the cause of that institution's establishment. The consumer would be hindered from taking advantage of those inventions that actually were perfected, by the restraint of the advertising systems possible only under private ownership of patents, with the resulting reversion to the slow progress prevalent in the days prior to the establishment of the patent office, when it took years to acquaint the public with the benefits to be derived from a new device. The loss of advertising revenue to the periodicals would necessitate an increase in subscription price, that would be prohibitive to the masses, and would deprive them of the best literature of the day, and the benefits incidental to its perusal, which they are able to secure today at less than the actual cost of production. The number of publications would also be disastrously reduced. It is to be hoped that no interested party will leave a stone unturned to prevent this bill from being railroaded through congress.—Robert B. Dunlap, C. A. Shaler Co.

## GETTING MOST OUT OF CAR

Detroit, Mich.—Editor Motor Age—Some people have so long associated the motor car with lavish upkeep expenditures that it requires a distinct mental readjustment to look on motor cars as a source of profit. Our sales records bear witness of the fact that the motor car is an economic investment.

Some months ago, on looking over the list of sales made by our New York office, my curiosity was aroused on finding seven different names signed to one contract. On inquiry, I found the car in question, a seven-passenger touring car, had been purchased jointly by seven men who lived in a Long Island town about 20 miles out and somewhat removed from the railroad. Every morning the car makes its rounds, picks up the seven men and makes a quick, exhilarating run into New York city, dropping each one at his office. All being in the town-town office section, this is quick work. At night the car calls and takes them home, refreshed by their trip. In addition, each family has the use of the car one day a week. The car is stored in a portable garage, and the cost of upkeep to each owner is about $1 a week.

Another Abbott-Detroit owner is a woman in independent circumstances. Her car has been fitted with a detachable bus body and has a route of twenty commuters whom she takes to the train every morning. In the evening she meets the train and motors her clientele home. She also takes a dozen children to and from school daily, and occasionally helps to take out picnics and excursions.—B. C. Spitzley, Abbott Motor Co.

IT occasionally happens that a car is brought into the repair shop with a complaint that the clutch slips in starting, takes hold too slowly, etc. When a clutch of the multiple-disk type begins to slip the trouble generally is due to maladjustment, too much oil, or an oil of too heavy a grade. To treat a slipping clutch of this kind one should turn the flywheel over until one of the oil plugs can be removed; pour in about a pint of kerosene oil; replace the plug, then have someone turn the engine over very slowly while the clutch is worked in and out for a few minutes. In this way the kerosene comes in contact with all of the internal mechanism of the clutch, and letting the clutch in and out forces the kerosene in and out between the plates or disks, cleaning away the thick and sticky oil. Some repairmen endeavor to clean the clutch in the above manner, but instead of turning the motor over slowly by hand while the clutch is being worked in and out, they do it while the motor is running, ignoring the fact that as the clutch revolves at speed the oil is held to the circumference of the case and therefore does not flow through the plates or flush through them as it should. This method, however, will meet with fair success if a sufficient quantity of kerosene is used. After the clutch has been thoroughly flushed, drain off the oil and kerosene, flush out if necessary, with a few gunfuls of gasoline, then, refill with the required amount of a mixture of kerosene and cylinder oil.

**Glazed Disks Cause Slip**

Another prolific cause of clutch slippage is the glazing of the disks. This occurs most frequently with dry-plate types, but the disk-in-oil clutches are not entirely free from this trouble, as in fast running with frequent manipulation of the clutch, the bulk of the oil is forced off of the clutch by centrifugal force, and what remains is rapidly burned by friction, forming a hard impervious glaze of carbon, which greatly impairs the adhesion of the disk surfaces. When this condition obtains, mere flushing out with kerosene will not suffice, for although keresene will cut the glaze to some extent, it will immediately harden again, if it is not removed.

To accomplish this, after the old lubricant has been thoroughly cleaned out, the motor should be run at moderate speed, and with the gears in mesh, and the hand brake set, the clutch worked in and out, almost stalling the motor at each partial engagement. This will rub the carbon loosened by the kerosene off the disk faces, when centrifugal force will carry it away.

## Slipping Disk Clutch

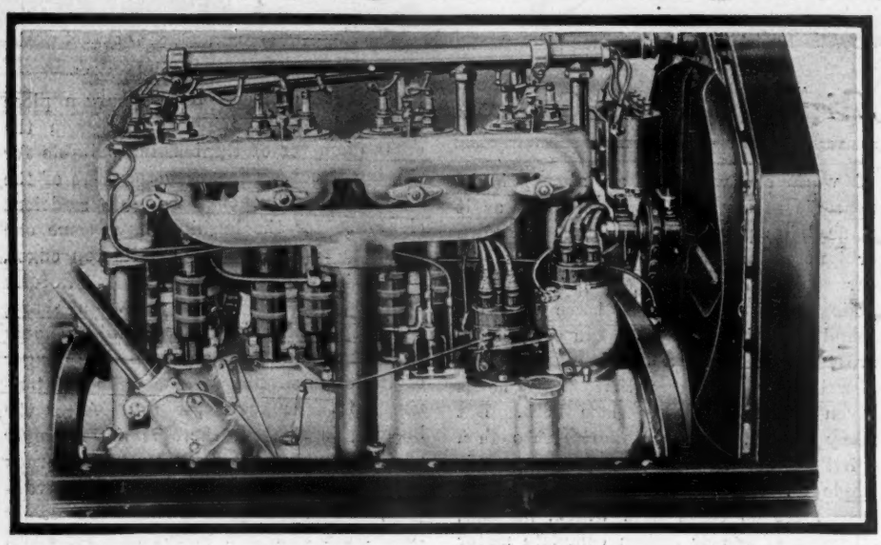
In almost all branches of mechanics, for cleaning up machinery and the hands of workmen, waste is an almost indispensable article; but as extensively as it is used, its proper use is either unknown or ignored in the majority of our motor car repair shops. It does not take the young repairman long to learn that the round paint brush and the can of gasoline are far superior to a bunch of waste for cleaning up a motor; that is, if he is given a chance to try them both. But many are denied these luxuries through a spirit of economy on the part of their employer. A very good brush can be purchased for 35 cents with which, perhaps, all parts of ten or fifteen complete motor cars, including motors, transmissions, rear axles, etc., could be effectively cleaned up, and only a very reasonable amount of gasoline required. For cleaning up the parts of a single car with waste, a pound of waste hardly would be sufficient, at least 1 gallon more of gasoline would be necessary to replace that which is splashed about when waste is used; and at this rate, when it is figured up, to clean up 10 cars, 10 pounds or more of waste would be used, which, at 10 cents a pound would cost about three times the price of a brush; 10 gallons more of gasoline probably would be wasted, which, at 15 cents a gallon would come to more than the cost of four brushes. To say nothing of the time occupied in picking sheds of waste off cotter pins and the like. Another case in which waste is erroneously used, is in wiping up the bearings, connecting rods, pistons, crankshafts and the interiors of crankcases, etc., just prior to their final assembly. Thousands of little fibers of waste adhere to the surfaces of these parts, and later on, when the motor is in action, the oil collects these little fibers and conducts them to some constricted portion of the system where they accumulate until the flow of oil through that duct is stopped to such an extent that a burnt-out bearing is the result. To avoid this practice one of the greatest gas motor factories of Germany supplies each of its mechanics with a pair of cloths about the size of a small face towel. These cloths are collected each week and laundered.

**Replacing the Bushings**

The removal and replacement of bushing is a job which rarely falls to the lot of the junior repairmen in the best regulated shops. Let us take, for example, the operation of refitting connecting rod bushings. To remove the old bushing, first examine the end of the rod containing it to see if any dowel pins are employed to hold it in place. Next secure a piece of round iron a trifle smaller than the outer diameter of the bushing suitable for driving it out. Then with the jaws of the vise open just enough to give sufficient clearance for the bushing, have some one hold the rod squarely upon its top edges, and with the round iron drift carefully centered on the bushing, give a sharp, light tap to start it. The first blow should be light so that there should be less danger of the drift slipping over a trifle and burring up the edge of the rod. After the bushing is started, there is little danger of this, and heavier blows may be struck with safety. Of course, if a press is available, the bushings can be more easily forced out and into place; and for small connecting-rod bushings the vise may be conveniently used for this purpose.

To position the new bushing, first inspect the end of the rod and see that it is not burred up where it rested on the jaws of the vise, and if a reamer of the proper size is at hand it should be used to test it for roundness. Next, see if the bushing can be started into place. If it can be forced part way in by hand, force it home with a hammer or between the jaws of the vise, using blocks of wood as cushions between both the bushing and the opposite end of the rod. If the bushing is too large, and a smaller one is not at hand, dress it down in a lathe if possible, for great skill is required to do this satisfactorily by hand. Do not ream or scrape out the rod to make the bushing fit, except in cases of injury as mentioned above; the bushing should be fitted into the rod, not the rod onto the bushing. When the bushing is in place, try the pin. It will be a tight fit in the new bushing, and it is proper that it should fit as tightly as it can be pushed in by hand. When in place it may be found that the pin, unless also a new one, will have worn slightly at the bearing sections, and so it will be a loose fit even though the larger part of the pin goes in hard. If excessively tight when in place, it will be liable to run hot, and should be removed and the bushing scraped, or, better still, use a hand reamer, being careful not to make the hole so large as to allow the slightest play. A bushing which fits a pin properly before being fitted into the rod is often found too tight when in place; this is caused by a slight compression of the bushing when driven into place. Therefore, always fit the bushing into the rod first, then the pin into the bushing. If the rod is drilled for oil, see that the bushing is drilled also and that it registers with the oil hole in the rod. Also, see that the bushing is properly secured in this position.

# 1913 Cadillac Has Increased Power



RIGHT SIDE OF NEW CADILLAC MOTOR SHOWING TWO DELCO DISTRIBUTERS AND

## Lengthened Stroke, Silent Chain Camshaft and Generator Drive, Greater Bearing Area Among the Changes

THE single 1913 Cadillac chassis will be similar to the 1912 model, with a few mechanical and constructional differences which make for greater efficiency and comfort for the passengers. The wheelbase has been lengthened from 116 inches to 120 inches, and with this increase of length a few body alterations have been made. In the main, however, the 1913 model will be easily distinguishable, as its outward appearance is still entirely characteristic of the line.

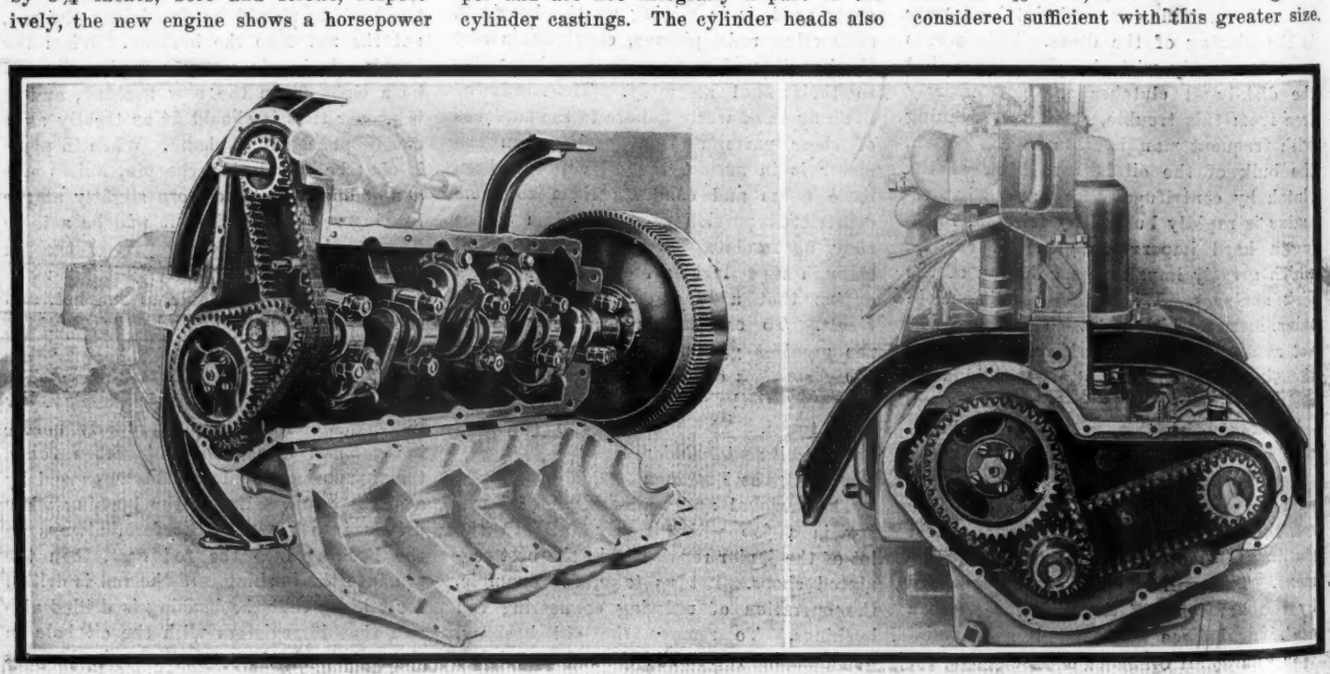
**Motor Shows Changes**

The most changes are found in the motor, the power of which has been increased. With a stroke-bore ratio of 1.28 due to cylinder dimensions of 4½ inches by 5¾ inches, bore and stroke, respectively, the new engine shows a horsepower increase over this year's motor of from 18 to 25 per cent, depending on the speed. The greatest percentage of increase is brought out at car speeds ranging from 12 to 35 miles an hour. This is due principally to the fact that the stroke has been materially increased over that of former motors, this year's engine having a stroke of 4½ inches. According to the S. A. E. rating, the new motor has a horsepower of 32.4, but this is extremely low since the motor is a long-stroke design. The Cadillac company rates the engine at from 40 to 50 horsepower, which it has developed on the block.

The cylinder construction remains the same, namely, the waterjackets are of copper and are not integrally a part of the cylinder castings. The cylinder heads also retain their former construction, and are removable. The entire cylinder construction is brought out clearly in one of the accompanying illustrations. The heads contain the valve chambers and they are fastened to the cylinders proper by means of nipples which are right and left-hand threaded, as shown in the sectional view. Waterjackets are clamped in position around the cylinders in such a way that any water leak is prevented. This particular cylinder design of individual parts has been a Cadillac feature for a number of years—ever since the company entered the four-cylinder motor car field. The four cylinders are of the L-head type, all the valves being placed on the right. Inlet and exhaust valves are interchangeable and their diameter has been increased from 1¾ inches to 2⅛ inches. Valve stems and springs are inclosed, which aids in the elimination of noise as well as preventing grit and dirt from getting into the bearing surfaces.

**Increased Crankshaft Diameter**

The crankshaft bearings are still five in number, but the number of mountings of the camshaft has been reduced from five to three. This has been done because the camshaft diameter is increased from ¾ inch to 1⅛ inch, and three bearings are considered sufficient with this greater size.

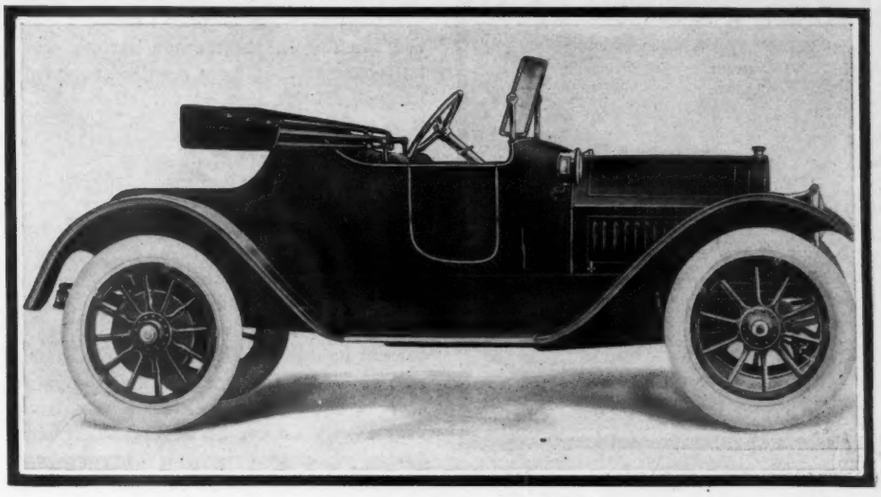


CRANKCASE AND OIL PAN OF NEW MOTOR AND SILENT CHAIN TIMING DRIVE

FRONT VIEW OF MOTOR SHOWING CHAIN DRIVE

# Chief Changes Are in the Motor

## Improved Delco Electric Starting, Lighting and Ignition System Continued as a Feature for New Season



1913 CADILLAC ROADSTER

The crankshaft and connecting rod bearings have been made larger, their diameter now being 2 inches. All connecting rod lower bearings have been given a length of 2½ inches, while the length of all main bearings except the rear one has been increased to 2⅞ inches. The rear crankshaft bearing now has a length of 4 inches. The enlargement of these various bearings gives larger wearing surfaces and tends to decrease vibration, making the working parts more rigid, and at the same time reducing materially any tendency to whipping stresses in the crankshaft.

**Silent Chain Timing Drive**

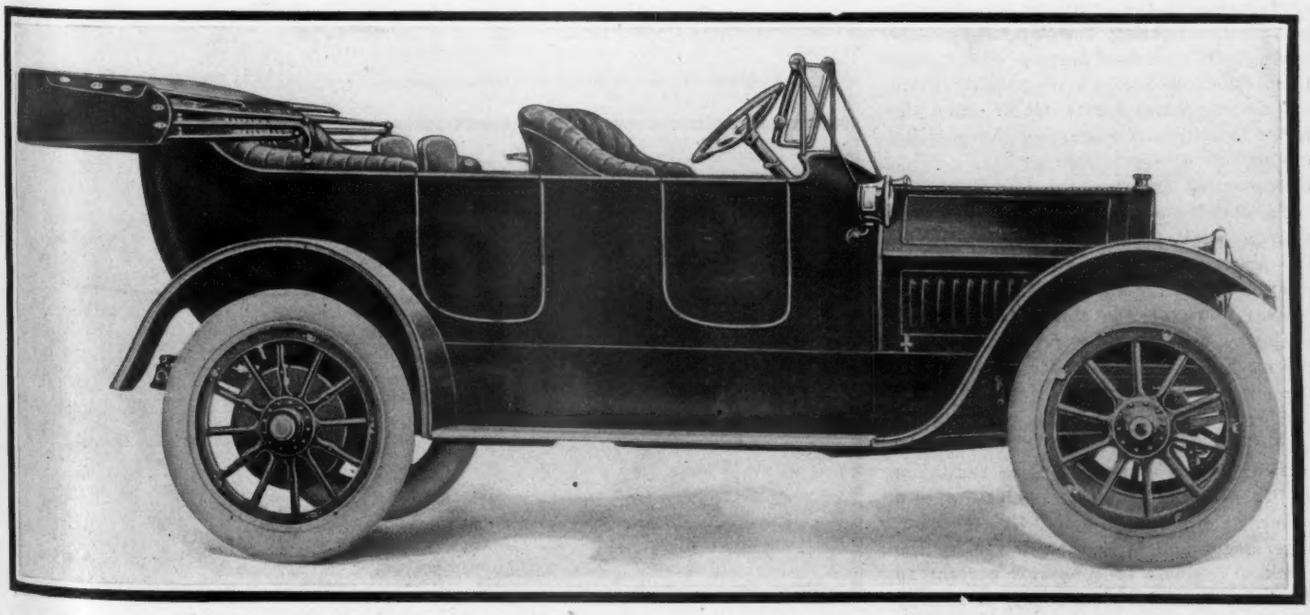
Another change in the 1913 motor is the use of silent chains to drive the camshaft and generator shaft instead of the formerly-used gears. These shafts are still driven from the crankshaft, as shown in the end views of the motor. The chains have a tendency to silence, which feature is the aim of all designers of today. The motor suspension also is peculiar to Cadillac cars. The suspending arms are seen in the motor illustrations. They pass over the top of the crankcase ends, and studs run from them through the upper face of the crankcase.

Cooling of the new motor is unaltered from that of the previous season. There are 147 vertical copper tubes which pass through 145 horizontal copper plates. The vertical tubes are staggered, allowing for free passage of air around them. The cooling water passes through the tubes, and its circulation is assured through the use of a centrifugal water pump located on the left side of the motor and driven from the same shaft as that which drives the motor-generator. The inlet and outlet water manifolds are of copper and of conventional shape. Cooling is assisted by a belt-driven fan, which is placed in the usual location between radiator and cylinders. It is supported by a bracket attached to the motor, and runs on two-point ball bearings. The center distances of the fan pulleys are adjustable.

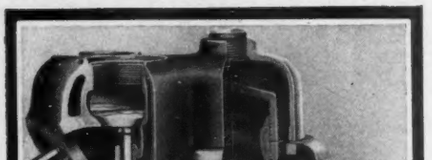
**Cadillac Lubrication**

The Cadillac lubrication system is of the splash type, in which the oil receives equal distribution to all motor parts. The oil supply to the various bearings is maintained through the use of a mechanical force-feed lubricator. The oil pan in the lower part of the crankcase is shown clearly in one of the illustrations. It is divided into four compartments, one for each connecting rod end to dip into. The sloping sides of these oil troughs cause the oil to flow from one to another of them, maintaining a constant level in all. The oil finally flows into a reservoir which is integral with the lower part of the motor base. In this reservoir the double-acting force pump is located. It forces the oil up through the sight feed and then to the compartments of the crankcase. Finally the oil reaches the reservoir again and the cycle is complete. For replenishing the reservoir oil supply, there is a filler and breather pipe which leads to the reservoir.

The water-jacketed carbureter is of Cad-



CADILLAC SIX-PASSENGER TOURING CAR SHOWIN G CLEAN RUNNING BOARD



CONSTRUCTION OF CADILLAC CYLINDER WITH COPPER WATER JACKETS

illac design and has been altered for the new season in that it now has only one adjustment for the air, in addition to the auxiliary air control on the steering column. The gasoline adjustment is now fixed and is regulated before the car leaves the factory. Formerly the carbureter was adjustable for gasoline proportion at the will of the driver. The familiar Delco combination electric system which was installed on Cadillac cars for the first time last season, is continued with a number of minor alterations, which tend to simplify it. The system consists essentially of a motor-generator, storage battery, voltage regulator and gearing between electric motor and flywheel. The motor-generator is placed at the rear left side of the engine, and when operated as a generator is driven by the same shaft as that which drives the water pump. This generator develops electrical energy for igniting the cylinder charges,—when the engine is running normally,—for lighting the lamps, and for charging the storage battery, the energy from which is used to temporarily drive the motor-generator as a motor when the latter is utilized for starting the gasoline engine.

**Operation of Starter**

To start the engine, the driver closes the starter-switch, thus electrically connecting the storage battery and the temporary electric motor. At the same time he presses down on the clutch pedal, which operation automatically engages teeth of the electric motor gear with those cut on the outer rim of the flywheel. The electric motor then turns the flywheel and crankshaft, until the driver releases the starting switch after the engine has taken up its ordinary running under its own power. The motor-generator then becomes a generator and is in turn driven by the gasoline engine. It generates current to fill the various electrical needs, as already brought out.

Ignition may be accomplished by another system in emergency, which is entirely separate and distinct from the generator system. Two sets of spark plugs are used. The other system is the Delco distributer system, which has a dry-cell current. Since the demand on the storage battery would be too great if it were required to furnish current for ignition at the same time as it is supplying the energy for driving the generator as a motor in starting the engine, this auxiliary dry-cell system supplies the ignition current at the time of starting. After the engine has been cranked, the operator throws off the dry-cell circuit and switches to the generator ignition circuit. This auxiliary ignition system also is of value should anything get out of order with the principal system.

When the motor is idling and the generator is consequently either being driven very slowly or not at all and is not producing sufficient current, that needed for lighting the lamps is furnished by the storage battery, which has a capacity of 130 ampere-hours. When the engine has attained a speed of 280 or more revolutions per minute, the generator current is strong enough for lighting and ignition purposes and it runs directly from the generator to the points of consumption. Any excess current generated is passed automatically to the storage battery, which when fully charged in this way floats on the line and will not receive any more charge.

**Changes in Electric System**

As to the changes which have been made in the electrical system for next year, these have tended to simplify it. The former controlling switch and ampere-hour meter have been eliminated, for the reason that two windings and two commutators are now used on the armature,—one for use when the unit is a generator and one when a motor,—making it possible to operate either as a motor or a generator unit on a 6-volt current. The battery for 1913 has also been changed, in that it is now of standard vehicle type, having three cells instead of the former twelve-cell design. A voltage regulator has been added which regulates the rate of charge to the storage battery, causing the latter to be charged at a less rate the more nearly it approaches its fully charged condition. The voltage regulator also controls the voltage to the various lamps.

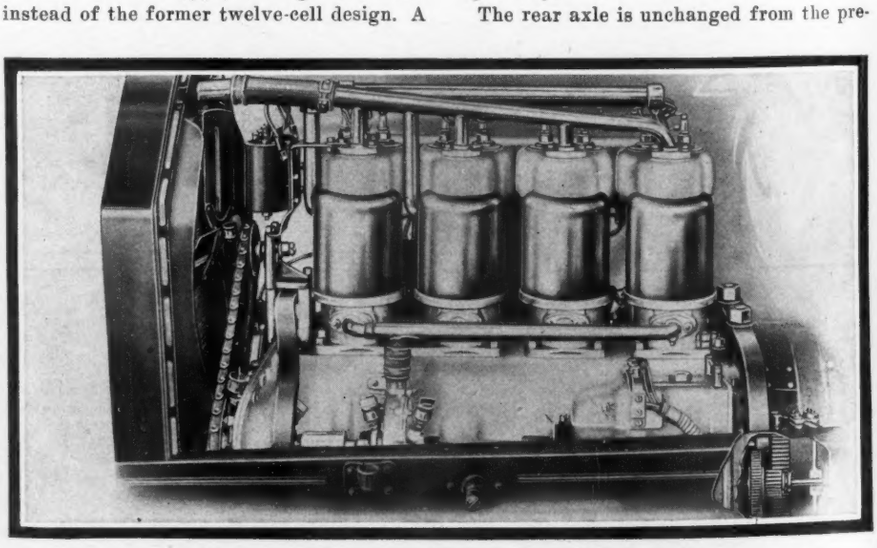
The gearing between the electric motor and the flywheel has been made 25 to 1, instead of the former ratio of 20 to 1. The constructional changes have doubled the cranking speed of the motor and the duration of cranking. The magneto spark has been changed. It is now automatically controlled by ring governor, which makes it unnecessary to give any attention to the spark when driving. Fuses have been placed on all lights to protect them.

**Transmission Details**

The Cadillac clutch is of the cone type, having the conventional leather facing, and its constructional details are brought out in the illustration. The clutch and its parts are made easily removable. It is provided with a spring ring in the flywheel with which ring the cone engages. This ring is split at eight points of its periphery, making sections, part of each of which is sprung inward. This arrangement provides somewhat of a give to the male member of the cone, and causes the clutch to engage very easily without jerk or bite.

The gearset remains of the three-speed, selective, sliding gear type. All parts consisting of gears, broach, transmission shaft and clutch shaft are of chrome nickel steel, while the unit is provided with annular ball bearings throughout. The drive is by shaft, direct to the differential and rear axle. Two universal joints are provided on the driveshaft. The forward universal is telescopic, while both are inclosed in spherical housings and run in oil. They are fitted with hardened and ground bushings and pins. The forward universal is self-centering. A V-shaped tubular torsion bar passes back to the rear axle housing alongside of the driveshaft in the usual way.

The rear axle is unchanged from the pre-



LEFT SIDE OF 1913 CADILLAC ENGINE SHOWING GEARS FOR SELF-STARTER

vious model. It is of the floating type of Timken construction and runs on Timken bearings. In this floating construction, the entire car weight is borne by the housings and the axle shafts are required to perform the single function of turning the rear wheels. They carry no weight. The differential gears are of carbon steel, while the live axle shafts are of a special alloy steel. The front axle is of I-beam, drop-forged type, and a new feature is the fitting of the front wheel spindles with Timken bearings at the top. All parts of the front axle, such as spring perches, yokes, tie-rod ends, steering spindles and knuckles are drop-forged.

The brakes are of the usual forms of internal expanding emergency and external contracting types. The drums have a diameter of 17 inches and a width of 2½ inches. They are bolted directly to the rear wheel spokes. Wheels are of the artillery wood type, having large hub flanges. They are fitted with demountable rims, and carry 36 by 4½-inch tires, these being larger than those equipped this year, which were 36 by 4 inches.

**Spring Suspension**

The spring suspension of Cadillac cars is of the three-quarter platform construction in the rear. This makes use of two half-elliptic side springs and one half-elliptic cross spring at the rear of the frame. The front springs are also half-elliptic. The rear side springs have been increased in length from 44 to 48 inches, while the rear cross spring remains 39½ inches in length. The front springs are 36 inches long. All have a width of 2 inches. The frame is of channel section and well braced by cross members. It has a double drop, making a total lowering of 2½ inches. The entire frame is 1 inch lower than that of the 1912 model. This gives ½ inch more action, since the front axle has been dropped 1½ inch. The frame width is 33 inches at the rear, and to allow for a short turning radius it is 3 inches narrower in front.

Right-hand control is retained, the gearshift and brake levers being at the driver's right and within the car. This is a new feature in that formerly the emergency brake lever was outside. This makes it possible to use the right front door. The gears are shifted by moving the lever through the conventional type of H-gate. The control levers are on top of the steering wheel on a fixed quadrant. A hand lever for the adjustment of the carbureter auxiliary air intake is placed underneath the wheel on the steering post. The wheel has a diameter of 18 inches. The steering gear is of the Cadillac worm and worm-gear sector construction, and is adjustable. Ball thrust bearings take the upward thrust from the front axle and wheels when the car is running.

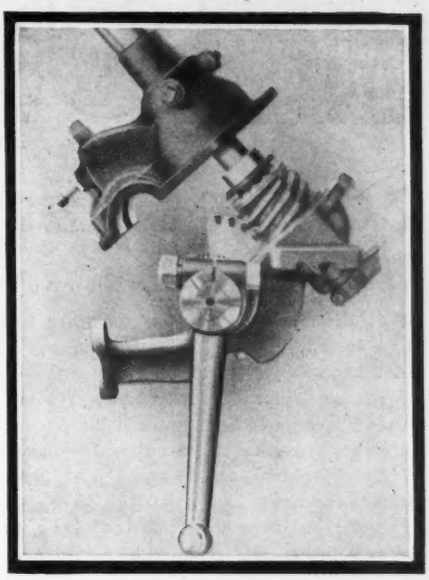
**Gear Ratios**

The gear ratios are given below for the final drive:

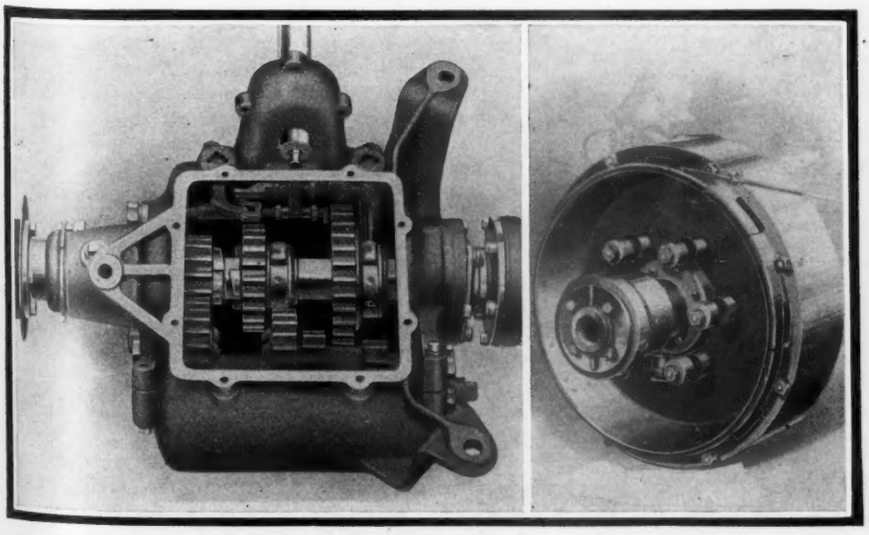
Touring car, six-passenger car, torpedo, coupe, phaeton—3.43 to 1.
Roadster—3.05 to 1.
Limousine—3.66 to 1.

Other ratios are provided at the option of the purchaser.

Seven body styles are fitted to the 1913 chassis. All open bodies have a cowl dash for 1913 instead of the former straight dash. Fenders also are shaped to follow the lines of the wheels, as the body illustrations will show. Foredoors are fitted on all open models, while door handles and hinges are concealed. The lengthening of the wheelbase to 120 inches has given the car a slightly more rangy appearance, although in all its styles the Cadillac is still distinctly a Cadillac.



CADILLAC STEERING GEAR



CADILLAC GEARSET AND CLUTCH

# Latest Alloy Is Stellite

## Invention of Elwood Haynes a Rival of Steel in Many Ways

ELWOOD HAYNES, motor car manufacturer of Kokomo, Ind., is introducing a new alloy which is a combination of two uncommon metals. The identity of these is not divulged, but the statement is made that this metal, while it contains neither iron, copper, lead, tin, zinc, nickel, aluminum, nor bismuth, can be made as hard as tempered steel, taking a keen edge, being well adapted for use in razors. It is further claimed that cold chisels made of this material will cut steel nails, ordinary machine steel, etc., with equal facility with steel, and yet, while steel is the only other substance that can do this stellite contains no steel.

The metal is furthermore claimed to take a high polish, which polish is not affected by mild acids, such as found in the juices of fruits. The metal in color stands between silver and steel. It does not oxidize readily, it is claimed, but under heat treatment will become a blue-black. It is asserted that it can be worked readily, although it is harder at working heats than is steel, and can be rolled hot into sheets, or drawn into wire. The alloy is said to be immune to the action of nitric acid, bichloride of mercury, and alkalis. It is slightly affected by hydrochloric acid, and diluted sulphuric acid has a more pronounced effect.

It rings clear, when tested with a hammer, whether cast or forged, and the following physical properties are claimed:

Elastic limit, 85,000 pounds.
Tensile strength, 110,000 pounds.
Elongation, 9 per cent.
Modulous of elasticity, 30,000,000 pounds.

The properties of this peculiar alloy are, according to the claims of Mr. Haynes: The hardness of tempered steel, with the resistance to atmospheric influences of platinum or gold.

# The Realm of The Commercial Car

# Some Phases of Contract Delivery

**By William B. Stout**

## When Motor Delivery Systems Are Perfected Mercantile Houses Will Have Outside Concerns Which Specialize in this Line Do Hauling

WHEN motor delivery systems are perfected, will not all city hauling of goods be done under contract?

With the increased use of expensive motored delivery equipment will not retail delivery at least be taken out of the hands of the merchant and handled by firms which specialize?

Can the ordinary store afford to keep up the new motor truck systems if their delivery work cannot keep the machine busy? Would it not be better for three or four such firms to club together and combine their delivery, syndicating to keep the machine busy and make it a paying investment instead of each of the three or four firms striving to keep up with the added expense of a motored vehicle of their own which their volume of delivery cannot make pay?

The motor truck is destined to revolutionize all road hauling. Just how and what changes will be brought about it is too early to say, and yet there is cause to believe that city delivery at least will finally come into the hands of some firm or firms which shall control all motor vehicles of that city engaged in delivery work. This combination will not be in the nature of a trust or monopoly but a sort of co-operative corporation which, by systems as hard-bound as those on which a railroad is conducted, shall work all motor trucks according to scientific systems and rules evolved and perfected as time goes on, enabling a service and low cost to be attained such as could never be reached by competitive methods by rival stores.

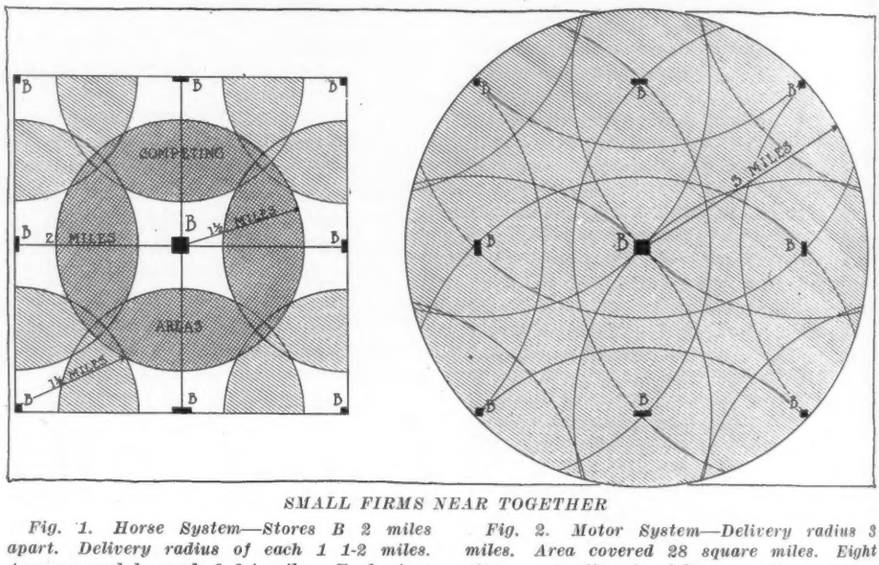
Prices are near standard between one store or business house and another, and at present service counts more than price. It is extra service that draws trade more than low price.

Suppose a merchant, then, were offered a way of giving twice the deliveries per day to his customers that he now accomplishes with little or no more cost to himself, or were told how he could deliver in less time from his store to the buyer. There would be an immediate interest. If he were told that it would mean co-operation with his competitors, however, he probably would dismiss the idea at once.

For this reason in many localities city delivery will have to be developed by separate companies instead of by co-operation among merchants, and handled under contract.

It is easy to analyze the general situation and point out why the eventual delivery in the average city will be of this nature.

Take a grocery situation, for instance, and, looking at Fig. 1, let us assume that the points B are stores located 2 miles apart, a good distance apart, indeed, for groceries in a well-settled community.




SMALL FIRMS NEAR TOGETHER

*Fig. 1. Horse System—Stores B 2 miles apart. Delivery radius of each 1 1-2 miles. Area covered by each 6 3-4 miles. Each store competing with neighboring stores in heavy shaded areas*

*Fig. 2. Motor System—Delivery radius 3 miles. Area covered 28 square miles. Eight stores competing in delivery radius. Sixteen deliver in same territory. Loss to all through duplication of territory*

With horse equipment, as in Fig. 1, the radius of delivery will be about 1½ miles each, covering an area of perhaps 6¾ square miles. Each grocery in this case will have a certain territory all its own into which no competition enters. The competing areas where delivery systems repeat in the same territory are shown shaded. But two firms cover the same territory in any case so that the "duplication of territory" is not great.

With the same stores shown in the same locations look at Fig. 2, which shows the effect of the adoption of motor trucks. The radius of delivery is at once doubled—and this is a low figure—giving a radius of action of 3 miles and an area covered by the delivery of close to 28 miles. When the central store B in the figure adopts trucks it at once covers territory in which eight other stores are actually located and invades the delivery territory of eight more. Its immediate advantage is at once seen. It can give service over this area as quick as the horse delivery stores can accomplish with their smaller area, and with fewer flies.

Seeing the advantage, suppose all the other stores adopt motor trucks, which they would have to do or be slowly driven out of business. At once the map looks like

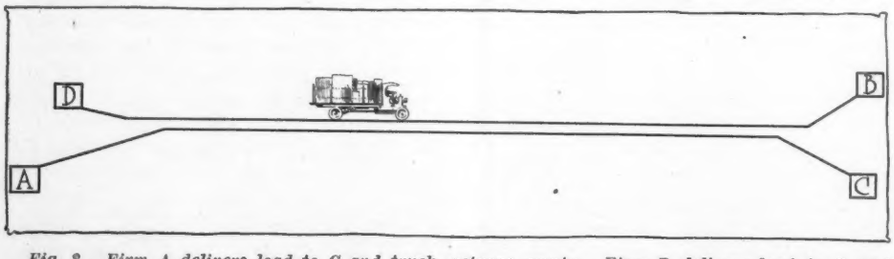



*Fig. 3. Firm A delivers load to C and truck returns empty. Firm B delivers load to D and truck returns empty. By combining work A can deliver to C and return with load from B to D, one truck thus doing work of two*

the work of a rose engine, all covered with circles and parts of circles. Each curve marks the limit of delivery of one store. No one store now has a territory to itself. Eight stores deliver to the very door of the central store B. Sixteen stores are competing directly with it. Delivery territory is duplicated eight times.

Suppose that four deliveries a day are made; this means that in a day's work thirty-two trips would be made to the neighborhood of the central store B by motor trucks on an average trip of 2½ miles or 80 miles of truck running. This makes 10 miles per truck per day in delivering to this one point.

Trucks in grocery work average 40 miles per day at a cost of, say, $8, or 20 cents per mile. The 10-mile haul would mean, then, a $2 cost per machine, or $16 for the eight machines delivering.

Supposing all these stores should combine, or that some firm should deliver their goods by contract. Instead of eight trucks making a trip to the same point four times in a day, these eight machines—if needed all at once—could be sent on separate routes so that each point is touched but four times a day by one truck. No truck duplicates the route of another and wastes mileage. Four trips to a point will do, then, what thirty-two accomplished before.

Putting these figures in a more understandable form, one can easily compare the cost and reasons for saving between the separate delivery systems from each store and the contract delivery by separate company or co-operative delivery by all as follows:

DELIVERY TO POINT B, FIGURE 2.

| | Deliveries per day | Trips to point B | Daily Mileage to point B | Cost per day run trucks to B |
|---|---|---|---|---|
| Separate Systems | 4 | 32 | 80 | $16 |
| Contract Systems | 4 or 8 | 4 or 8 | 10 to 20 | $2 to $4 |

These figures, it is understood, take in no other points but the one in question and are purely theoretical to illustrate the cost for any one point of delivery of the "duplication of territory."

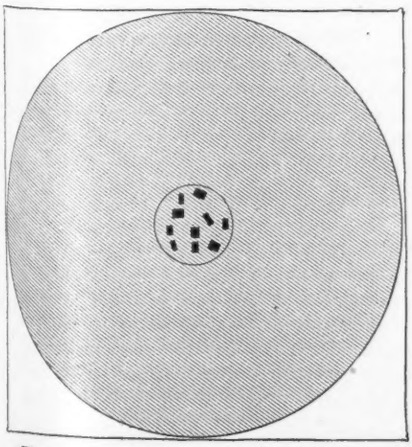


*Fig. 4. Heavy or Bulk Loads—Each store in central district covers entire city, ten delivery systems overlapping. By combining effort or by separate contract company a single delivery can cover entire town at each period instead of ten with consequent saving and facility of delivery service*

## MAKING A SHOWING

*A lazy job makes a lazy brain, but plenty to do makes a quick thinker.*

*The idle man is a creature of discontent, but a busy employe is a satisfied worker.*

*The greatest labor troubles with the least basis of fault-finding behind them come from men whose work has in it a large percentage of idle time, teamsters who must loaf and work below their capacity while they wait on horses, street car men whose work is intermittent, men in branches of labor which already have very short hours. The reason is not with the man but with his use.*

*Every man is creative. If his life is creating he is happy; if he is but a part of a machine or working but to part of his capacity it is his nature by all the gifts given him to be discontented. If he is producing something which makes his life of account in the world he is happy. The same is true not only of the laboring man but in every branch of life. It is but nature to create, to work to capacity.*

*The coming of the motor truck will do away with discontented drivers. Not because they will receive a higher wage—though that will be—nor because the work in itself is more enjoyable than driving a team—though this too is true—but that with the greater efficiency of the machine which he handles the man will have every chance to work to his capacity, to develop his mind to quick thinking and reasoning, to make a showing for the time he spends.*

*A busy mind means a contented one, and producing to capacity, whether it be a factory or a man, means a profitable business.*

If two railroads run side by side, serving the same towns and each handling but half capacity both roads probably will be losing money. If one road should suddenly disappear the remaining road would have business enough to make money. If two motor trucks are running over the same territory in the delivery of the same kind of goods to the same class of trade and neither machine working to capacity, it would seem that it would pay for the two firms to combine effort and let one truck handle this route for both firms.

When eight expensive motor trucks are serving the same area in the same work there is an expense of upkeep too serious to let pass. It is in this line of hauling with much overlapping of delivery area that the delivery firms of the future will find their greatest field.

The matter of the number of stops will be an important one, but in using even half the number of vehicles on the same territory the firm can afford to put two men to a wagon or more if necessary, minimizing the time of each stop by this and by special devices.

Thus is given but a general outline of the delivery situation and its meaning in the average residence locality where competing stores are near together and thus competition keen. A deeper study and analysis than can be given here will reveal many interesting things not touched upon, all leading to the opinion that in the eventual state of things business will be more concentrated, with fewer and larger stores, while delivery of goods will be a business apart.

There are other lines of haulage work where a combination of effort on the part of motor truck users can work out a considerable saving. Fig. 3, for instance, shows a condition very often found in large business communities. Here a firm at A handling goods in quantities has a warehouse at C, or C may be a freight house to which goods is hauled. The motor truck in delivering to this point, say, 4 miles away, returns empty so that only half of its mileage per day is productive. Close to the warehouse or freight yard C is a factory B which delivers its product to the city center near A at D by motor truck. This firm's motor truck is full running down-town to D but returns empty, thus losing half of its time.

By combining effort the firm A could carry its load to C and unload, then proceed to B, load up and run back to D loaded. The only empty runs would be the short distances between A and D and between C and B. The one truck would be doing the work of two—except the extra loading and unloading time—and each firm save accordingly.

Many firms not in position to do this can hire a truck from a contracting firm, which can make such an arrangement, thus hauling for the firm A cheaper than it can operate its own truck. Fig. 4 illustrates the interference of delivery systems of down-town stores in an average city in covering the territory shown by the circle.

Each one of these stores or shops covers the whole area of the city in its delivery work. Ten stores are shown, meaning that

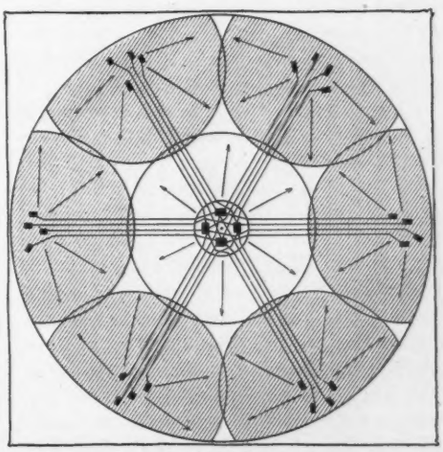


*Fig. 5. Department Stores to Sub-stations—Showing how by combining effort one sub-station in each section can do work of four, saving eighteen sub-stations and their expense, and allowing more deliveries, simplifying loading, handling, distribution and routing. Traffic congestion also would be reduced very materially by this arrangement*

PATHFINDER 1500-POUND DELIVERY CAR

each point of the city is visited ten times each day by a delivery vehicle from these stores. A firm combining all the delivery work of a city could accomplish better service and more deliveries per day on possibly half the cost of present systems. One system of delivery would cover the circle area instead of ten, with a consequent saving.

In larger cities where downtown stores deliver to sub-stations and distribute from there, there also is a chance for great saving by this line of work. The motor trucks operating for city department stores operate, as a general thing, for only 3 hours of the day. The rest of the time is wasted on account of delivery schedule. Fig. 5 shows an arrangement similar to that used by these stores.

The central circle represents the loop or business center where four stores are shown. From these, from three to five times a day, run 3-ton to 5-ton motor trucks to leave their loads at the sub-stations. From these sub-stations smaller vehicles, horse or electric, as a rule, deliver in house-to-house work.

Thus the four stores shown have to keep up four expensive sub-stations in each district, twenty-four in all, fitted out with every facility for the quick handling of the load when it comes in, transferring it in the least possible time to the smaller wagons, according to routes, and each station employing five to fifteen men and boys intermittently for this work. These stations are idle except for the 15 or 30 minutes of each delivery period every day.

The drawing shows a city in question divided into seven districts, the central one serving direct from the stores and six outside sub-stations. Each of the four firms has sub-stations in each of these districts, making twenty-four stations in all, and over the whole area of each there are four simultaneous deliveries.

If this work were handled by a separate firm but one station would be needed in each section and eighteen stations, with their expense, could be immediately done away with. Instead of four motors delivering to each territory and crossing and recrossing each other, two or three machines at most could do the work in much less mileage and time, while instead of four deliveries per day six or eight more would be possible. By the elimination of what we have called the duplication of territory, the saving could be put into extra service for the customer at no extra cost to the merchant. Motor trucks now operating but 3 hours a day and losing money could then run 10 to 12 hours a day. True, it would mean a reorganization of all the delivery systems, but the end would justify it.

There is need for a greater concentration of effort in the matter of goods distribution. Horse wastes longer are not necessary. Efficient systems and sound business methods of distribution are at our command. The merchant who has been sleeping contentedly in the conviction that the old methods were good enough for him is awakening to the cold, hard fact that if he doesn't devise some way to give to his customers an increased service such as stores at a distance are giving in his own territory, some morning he will find no business left.

Some men sleep lightly and are awakened by a whisper, others let Big Ben run down without a movement to indicate that they have heard the alarm. It is the early bird that catches the worm. The man who realizes first and takes advantage reaps the reward.

## PITTSBURGH TRIES TRUCKS

The new 10-ton truck recently purchased by the city, is now in service. Others are to follow soon, each will displace six teams of horses and as many drivers. Each year the city uses up about $2,000,000 worth of supplies which have to be hauled from the railroad stations. It buys everything from nails to machinery and hay to canned peaches. It is the largest corporation in its end of the state in the foodstuffs markets, as it feeds more than 500 persons at its two poor farms, maintains scores of horses and gives out thousands of dollars worth of goods through its charities department every year. All of this stuff has to be delivered, since Director Oursler has taken to the policy of getting his goods where he can get it at the best rates. Formerly the local dealers who got all the contracts delivered the goods to its destination and for this reason, little hauling was necessary.

## ENTERS COMMERCIAL FIELD

The Motor Car Mfg. Co., Indianapolis, Ind., which for a number of years has been devoted solely to the construction of pleasure cars, has announced a departure in the form of a 1,500-pound delivery wagon which will be one of the Pathfinder 40 Series 13 line of cars.

Two Pathfinder 40 trucks were built on order for the A. Keifer Drug Co. and the Charles Mayer Co., both of Indianapolis, Ind. The trucks were in use just a week when a repeat order was received from the A. Keifer Drug Co. for another Pathfinder delivery wagon. The entry of the Pathfinder builders into the commercial field, tried at first merely as an experiment, has thus turned out to be such a success that a large number of commercial cars will be manufactured in 1913.

The Pathfinder delivery wagon is built on the regular pleasure car chassis. The body is graceful, sturdily constructed and receives the same care in finish and workmanship that is devoted to the pleasure bodies. The decision to build the truck on the pleasure car chassis came after exhaustive experiments. It was found that the springs and mechanical features of the Pathfinder chassis are stout enough to carry much more than the 1,500 for which they are intended.

The new delivery car will have a wheelbase of 120 inches. The control is identical with that of the pleasure cars.

## TO DO TRUCKING BUSINESS

An independent trucking system using electric vehicles exclusively and competing with the horse-drawn vehicles now in use by the majority of the trucking firms of Boston is the latest recommendation from the special committee of the Electric Vehicle Club of Boston appointed to look after business problems.

The principle object of the contemplated move is the education of the business men in the growth, durability and economical operation of the electric vehicle, although it is believed that the company will be self-supporting and will later on be purchased by private individuals or a corporation when its success has been fully demonstrated. The avowed intention of the committee is to compete actively with teamsters with a view to increasing local sales of electric vehicles among this class of prospective customers as well as among the large corporations doing their own transportation.

In detail, the project that has been laid before the club by a special committee appointed to devise ways and means for promoting the sale of electric commercial

cars in Boston, calls for the organization of a $100,000 company under the auspices of the commercial section of the club. Not less than one-half of the stock is to be subscribed or raised by truck, tire, battery and other interested concerns, and subscriptions to be payable either in cash or in suitable equipment.

### LONG SERVICE WITHOUT OVERHAUL

A motor truck which works for 18 months in continuous service without overhaul and which never has come back to the shop for repairs during that time is worthy of notice. The Kisselkar Chicago branch is just completing the overhaul of such a truck—a 3-ton Kissel—which has been in continuous service for the time mentioned, hauling an average load of over 3 tons with a daily running distance of close to 40 miles. The machine has been hauling for a contract delivery concern, working during the period named for the Wisconsin Pea Canners' Association, the Illinois Steel Co. and the Warner Transfer Co. of Chicago. During this time 2 full sets of tires were used, these having the Chicago guarantee of 8000 miles.

### NEW MOTOR PLOW TESTED

John I. Hoke, of Frankfort, Ind., has invented and built a motor plow which was seen in operation by experts from the Oliver Chilled Plow Works of South Bend, and the International Harvester Co., of Chicago, and by a number of South Bend business men.

The essential of the plow is a motor car engine mounted on a frame supported and carried by two large wheels with 10-inch tires, the frame carrying beneath it two plowshares. A seat for the driver is placed at the rear end of the frame. From this seat he operates the plow. In front of the wheels is a long guiding arm which runs in the furrow and serves to keep the machine in a straight course.

The engine develops from 40 to 50 horsepower and consumes from 1 to 3 gallons of gasoline per acre according to the contour of the land and the character of the soil. The plow will plow about 8 acres of level land in a 10-hour day and do the work of four men and four teams under similar conditions. It is easily operated by one man.

### NEW SCREW-POWER HOIST

By the use of a new screw-power hoist dumping body designed by the Peerless Motor Car Co. the Southern Fuel and Material Co. of Mobile, Ala., has accomplished with its 5-ton truck the transportation of the unprecedented volume of 150 tons every 24 hours. The truck in a night and a day covers 100 miles.

It is replacing 12 mules. It makes ten trips in a working day over a distance of 5 miles. In the truck body is carried from 5 to 6 tons of gravel and in wagons formerly drawn by mules, which are used as trailers, 25 tons more is handled. Recently the truck has worked night and day, doubling that mileage and tonnage. The performance is in part due to the use of the power dumping body built to meet the problems of coal dealers and contractors, which will unload 5 tons of coal, sand and gravel, or any loose material, in 30 seconds. The truck is backed into position. The lever that unlatches the tail gate is tripped. Another lever turns the power of the truck motor into the dumping mechanism. The front end of the body rises rapidly. In 30 seconds the entire load is off the platform.

Instantly the truck may be started on its return. A touch upon the controlling lever starts the body downward and it can continue to descend while the truck is in motion. When the body reaches its normal position the machanism is automatically disengaged.

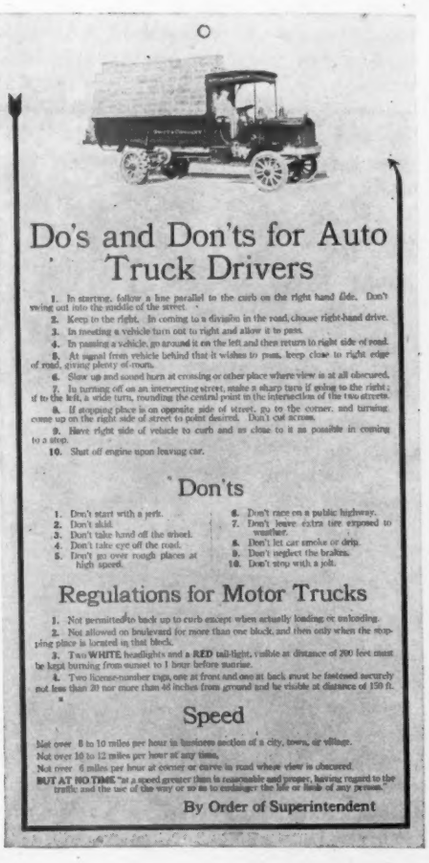
A motor train, consisting of a large gas tractor and several trailers built along the lines of a railway flat car, the whole using the public highways as tracks, has been placed in operation at Menominee, Mich., by C. I. Cook. The train makes several trips daily into the neighboring communities to bring fruits and vegetables into the market and provide supplies for the Michigan Canning and Preserve Co. of Menominee.

# Packer's Rule for Truck Drivers

DRIVERS of motor trucks are prone to take advantage of clear stretches for making up time and hate to waste time in going clear to the corner and back to their destination when it lies in the middle of the block and on the other side of the street. Employers are beginning to understand that transportation of their goods is expedited when their drivers obey implicitly the rules of the road and the traffic regulations of the locality in which they are operating, and are realizing also that they must see that the drivers obey these rules without leaving it all to the police. Swift & Co., of Chicago, has seen the need of this personal supervision and the superintendent of this concern's fleet of trucks has issued a set of rules printed on a card which is hung in each vehicle where it meets the driver's eye frequently. The instructions printed on the card are given below:

DOS AND DONT'S FOR MOTOR TRUCK DRIVERS

1. In starting, follow a line parallel to the curb on the right hand side. Don't swing out into the middle of the street.
2. Keep to the right. In coming to a division in the road, choose right-hand drive.
3. In meeting a vehicle turn out to the right and allow it to pass.
4. In passing a vehicle, go around it on the left and then turn to right side of road.
5. At signal from vehicle behind that it wishes to pass, keep close to right edge of road, giving plenty of room.
6. Slow up and sound horn at crossing or other place where view is at all obscured.
7. In turning off an intersecting street, make a sharp turn if going to the right; if to the left, a wide turn, rounding the central point in the intersection of the two streets.
8. If stopping place is on opposite side of street, go to the corner, and turning, come up on the right side of the street to point desired. Don't cut across.
9. Have right side of vehicle to the curb and as close to it as possible in coming to a stop.
10. Shut off engine upon leaving car.


Do's and Don'ts for Auto Truck Drivers
1. In starting, follow a line parallel to the curb on the right hand side. Don't swing out into the middle of the street.
2. Keep to the right. In coming to a division in the road, choose right-hand drive.
3. In meeting a vehicle turn out to right and allow it to pass.
4. In passing a vehicle, go around it on the left and then return to right side of road.
5. At signal from vehicle behind that it wishes to pass, keep close to right edge of road, giving plenty of room.
6. Slow up and sound horn at crossing or other place where view is at all obscured.
7. In turning off an intersecting street, make a sharp turn if going to the right; if to the left, a wide turn, rounding the central point in the intersection of the two streets.
8. If stopping place is on opposite side of street, go to the corner, and turning, come up on the right side of street to point desired. Don't cut across.
9. Have right side of vehicle to curb and as close to it as possible in coming to a stop.
10. Shut off engine upon leaving car.
Don'ts
1. Don't start with a jerk.
2. Don't skid.
3. Don't take hand off the wheel.
4. Don't take eye off the road.
5. Don't go over rough places at high speed.
6. Don't race on a public highway.
7. Don't leave extra tire exposed to weather.
8. Don't let car smoke or drip.
9. Don't neglect the brakes.
10. Don't stop with a jolt.
Regulations for Motor Trucks
1. Not permitted to back up to curb except when actually loading or unloading.
2. Not allowed on boulevard for more than one block, and then only when the stopping place is located in that block.
3. Two WHITE headlights and a RED tail-light, visible at distance of 200 feet must be kept burning from sunset to 1 hour before sunrise.
4. Two license-number tags, one at front and one at back must be fastened securely not less than 20 nor more than 48 inches from ground and be visible at distance of 150 ft.
Speed
Not over 8 to 10 miles per hour in business section of a city, town, or village.
Not over 10 to 12 miles per hour at any time.
Not over 6 miles per hour at corner or curve in road where view is obscured.
BUT AT NO TIME at a speed greater than is reasonable and proper, having regard to the traffic and the use of the way or so as to endanger the life or limb of any person.
By Order of Superintendent

DON'TS

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# From the Four Winds

HOW A GASOLINE FIRE LOOKS. ELEVEN TANKS IN PONCA CITY, OKLA., OIL FIELD STRUCK BY LIGHTNING

**MINNEAPOLIS Club Tests Gasoline**—Attorney G. A. Will, of the Automobile Club of Minneapolis, has complained to the state oil inspection department that some dealers are delivering a lower test gas than motorists are paying for. Samples have been taken from supply houses to investigate the charge.

**Could Not Fool the Judge**—When some motorists who were arrested in Lynn, Mass., a few days ago, charged with using their muffler cutouts and making a needless racket, pleaded in their defense that it was necessary to open the muffler to get more power going up the slight grade, Judge Avery waited until the cases were finished and then he imposed $5 fines on all the defendants as a method of teaching them that they had gears in their cars, which could be used by the shifting of a lever, if they were not too lazy, and thereby get along without opening the muffler. The judge is a motorist and he could not be fooled.

**To Build Concrete Roads**—Raising of $3,000,000 by a county bond issue for immediate construction of trunk highways with a concrete base in King county, Wash., is the object of a movement launched by Frank M. Fretwell, secretary of the Automobile Club of Seattle and secretary of the Pacific Highway Association. In advancing the project he has enlisted the interest and support of a great number of prominent business men and heavy property owners of Seattle. Impressed by the wonderful system of public thoroughfares laid out and built at a cost of $3,000,000 by Los Angeles county in California, and the immediate financial benefits that are being derived, Mr. Fretwell, during a recent visit to the south, decided to interview representative citizens of Seattle, with a view of ascertaining the sentiment regarding the plan to bond King county for a like sum.

**Milwaukee Treats Orphans**—The sixth annual orphans' outing of the Milwaukee Automobile Club was held on August 28, and 400 parentless waifs were entertained with a ride about the park and boulevard system and a picnic in Washington park, the largest in the city. One hundred and seventy cars were provided by members of the club for the transportation of orphans and attendants from five asylums. William H. Pipkorn, originator of the orphans' outing idea in Milwaukee, and manager of the first five outings, was again in charge.

**Good Roads War in Alabama**—With the rapid increase in the number of owners of motor cars throughout the state the question of good roads has become the livest issue in Alabama politics. The liquor question, which has held first place on the boards so long, is giving way to the new issue. The recent elections developed the fact that it is the wealthier members of the rural communities who are opposing the good roads movement. The small farmer and the mercantile men of the towns and villages have voted for the extra taxes and for the bond issues. The large land owners claim that taxes already are exorbitant and in most districts they have been able to rally a considerable following. The factions are equally divided as to numbers and interesting contests are promised in a number of counties where roads are to be voted upon. Motoring clubs in the cities and larger towns are sending speakers to the counties where a vote is to be taken soon, and are helping in every way possible to carry the election in favor of better highways throughout the state.

**Campbell Continues Good Work**—Secretary Chester I. Campbell, of the Boston Automobile Dealers' Association, who recently took 3,000 orphan, blind and crippled children on an outing, gave another outing to the inmates of the almshouse and home for aged couples of Wollaston and Quincy, taking about 50 on a trip to Sharon for the day.

**Minneapolis Has 5,000 Cars**—The city assessor of Minneapolis has listed 4,724 motor cars in 1912, as compared with 3,044 in 1911. The valuations are $2,296,900 and $1,721,655. The value of the additional machines, 1,700 in all, is given at $571,000. This is on a 50 per cent basis. The fourth ward, containing some of the best families, reports 1,848 machines, and the eighth, similarly blessed, reports only 1,017 cars owned.

**Sixty-seven in Harvest Moon Tour**—The Milwaukee Automobile Club conducted its first annual Harvest Moon tour on Saturday evening, August 24, from its clubhouse at Milwaukee to Oconomowoc, the famous summer resort, and return. Sixty-seven cars participated. The start was at 5 o'clock and dinner was taken at Lalumier hotel on Oconomowoc lake at 7 o'clock. The return trip was begun at 8:30 o'clock and the route was via Waukesha, where a party of 20 cars from the Waukesha Motor Club was picked up and taken to the Milwaukee clubhouse for a buffet luncheon and informal dance.

**Prod Up Road-Builders**—It has been discovered, through the activities of the Chicago-Milwaukee Good Roads Association, that the Wisconsin state aid law of 1911 contains a section which makes it most simple for a few individuals to compel permanent highway improvement effort in any part of the state. The section means that any group of freeholders resident in any part of Wisconsin may force a township to make an improvement of highways by paying into the town treasury a sum equal to one-sixth of the cost of the proposed work, in no case less than $200, at the same time presenting a petition to the board to do the work. This must be done before August 15 of any year. The board is then required to levy an equal amount and petition the county for the improvement, the county board being obliged to carry out the work. The Wisconsin division of the Chicago-Milwaukee association has

gone through the formula in several townships of Wisconsin, through which the proposed improved highway passes assuring the completion of the road before the middle of next year. The remedy was invoked only when townships refused absolutely to vote improvements of their own accord.

**Turns to Street Improvement**—Having devoted so much attention to the improvement of roads and highways in the state, and on to Salt Lake City, the good roads committee of the Omaha Commercial Club at a luncheon last week decided to work for the improvement of the boulevards in the city limits. Harry Lawrie was appointed chairman of a subcommittee which will consider plans of operation.

**Transcontinental Route Through Tunnel**—Kalispell, Mont., is arranging to have the northern transcontinental route laid through that city and Glacier park, not far distant. Part of the way the old road bed of the Great Northern railway will be utilized, and the summit of the mountains will be negotiated through the Haskell tunnel, in which a good road has been laid. The citizens have taken up the question of routing a national reliability run through that section.

**Massachusetts Highway Outing**—The annual outing of the Massachusetts Highway Association was held a few days ago and there were 221 members on the trip. The run was made in motor cars from Boston to Somerville, Cambridge, Arlington along the Paul Revere route to Lexington park, where a luncheon was served. The return trip was by way of Bedford and Concord, giving a chance to see the maintenance of the state roads.

**Moline Plans Hill Climb**—A hill climb will be held at Moline, Ill., the morning of Labor day, under auspices of the Davenport Auto Club, whose membership includes Rock Island and Moline automobilists. Eight events are carded, the big race to be the Josephson cup free-for-all. This event is limited to amateur drivers, cars to carry full factory equipment. Entries are limited to members of the Davenport Auto Club.

**Will Have Fall Show**—Omaha will have a fall motor show, during the Ak-Sar-Ben carnival week, in order that the 1913 models of the cars may be shown to the thousands of outsiders who come to the city during that time, the last week in September and the first in October. It will not be held at the auditorium, where the February shows are given, but will be a street or garage show. The garages will be decorated with the association colors, green and white, some of the dealers having worked out elaborate decoration schemes. The Omaha streets are strung with rows of incandescent lights during the carnival, and these will be extended up along automobile row. All of the companies will have a complete line of the new models on display. It is estimated that the combined auto show and carnival will induce a large per cent of the state dealers to visit the city, as many have signified their intention of doing so, and in addition there will be a large number of prospective buyers. The promise of bumper crops in the state are leading all of the automobile men to predict record sales this fall.

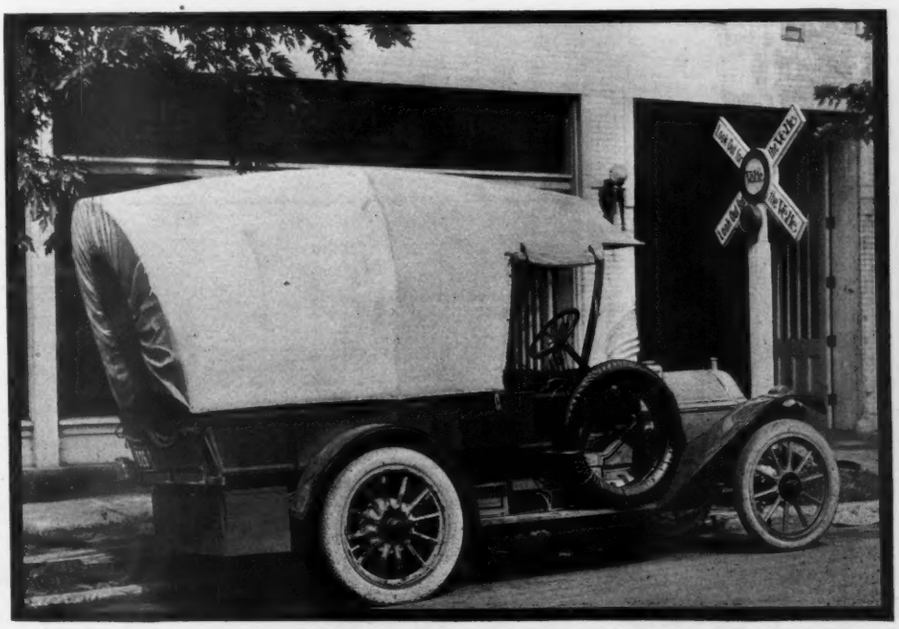
**To Tour Meridian Road**—Vice-presidents of the Winnipeg-Galveston Meridian road met last week in Brookings and heard reports promising completion of the road within a year. In South Dakota the national colors will be used in the road signs. Telephone poles every 2 miles will be marked with red, white and blue six-inch bands. Two poles will be marked at turns. About 60 miles has been marked already with an iron sign, which has been adopted for the purpose. A motor tour will be conducted August 31 along the route from Sioux City to Big Stone lake and will last 3 days. The tour of the Automobile Club of Watertown, S. D., over the connecting road from Minneapolis to the Meridian road at Watertown, has been postponed to September 2.

**New Orleans Has Motor Detail**—New Orleans motorists are to be given special protection by two special detectives which have been added to the city force. On the other hand, abuses on the part of reckless drivers will be watched more carefully than ever. The two special officers will be charged with no other duty other than that connected with motor cars. They are expected to familiarize themselves as much as is possible with the cars owned in the city, so as to know at sight if the car is being handled by the owner or his chauffeur. Joy riding by chauffeurs and their personal friends unbeknown to the owner of the car will be watched for carefully. Drivers with a reputation for exceeding the speed limit will be kept under surveillance until the infraction of the law is stopped. Special vigilance will be maintained to protect standing cars from thieves and to eliminate so far as is possible overcharges on the part of drivers of taxicabs.

**Minnesota Reports Registrations**—In the advance sheets of the biennial report of the Minnesota secretary of state attention is called to growth in the registration of cases. At the close of business July 31 the department had issued nearly 26,000 licenses, 4,000 motorcycle numbers and 3,000 chauffeur licenses. The report reads that the ratio of increases will give the state 30,000 motor car registrations in 1912.

**Mexican Touring Dangerous**—Rebel activities close to towns in the federal district of Mexico and close to the limits of the capital are causing a falling off in motor car touring in this section. Only a few mornings ago the dead bodies of a chauffeur and another occupant of a motor car were found lying upon the highway near a suburban town, and it is supposed they were killed by Zapatistas, as the rebels under Emiliano Zapata are called. It is even considered dangerous to make the trip to and from the country club at night.

**Richmond to Have Show**—The Richmond Automobile Association, of Richmond, Va., has petitioned the state corporation commission for a charter. The maximum capital of the new corporation will be $50,000 and will be limited to the ownership of ten acres of land. The object of the association is to hold annual automobile shows, the first one being proposed for February of next year.



VELIE TRUCK ACCOMPANYING A KANSAS MOTORCYCLE RUN, WITH COTS FOR 200 TOURISTS

*Notice the danger signal in front of this Kansas City garage. This signal is connected with a trap inside the garage. A car coming out crosses the trap and rings a bell as a warning to passing pedestrians*

# Current Motor Patents

PATENTS ISSUED AUGUST 20, 1912.

1,035,851—Elastic Tire for the Wheels of Vehicles. Frederick Elijah Blaisdell, Hammersmith, England. Filed August 10, 1909. Serial No. 512,172.

1,035,870—Vehicle Tire. John G. Funk, Swissvale Borough, Pa. Filed November 4, 1911. Serial No. 658,474.

1,035,899 — Internal Combustion Engine. John R. Pearson, New York, N. Y., assignor, by mesne assignments, to Pearson Reciprotary Motor Co., a corporation of New York. Filed October 1, 1911. Serial No. 652,864.

1,035,907—Wheel Retaining Means. Thomas G. Rice, Wheeler, N. Y., assignor of one-fourth to William G. Dean and Robert J. Scott, Prattsburg, N. Y. Filed November 24, 1909. Serial No. 529,662.

1,035,911—Resilient Wheel. Max Charles Rose, Cleveland, Ohio, assignor of twelve and one-fourth one hundredths to M. M. Kann and twelve and one-fourth one-hundredths to Sidney Hirsch, Pittsburg, Pa., six and one-eighth one-hundredths to George D. Adams, six and one-eighth one-hundredths to Frank E. Hall, four and one-twelfth one-hundredths to Emanuel S. Well, four and one-twelfth one-hundredths to David Rosenblum, and four and one-twelfth one-hundredths to Edmund R. Bondy, Cleveland, Ohio, and twelve and one-fourth one-hundredths to Gustave H. Kann and twelve and one-fourth one-hundredths to Fred J. W. Bowery, Pittsburg, Pa. Filed July 19, 1911. Serial No. 639,407.

1,035,912—Wheel. Max C. Rose, Cleveland, Ohio. Filed October 28, 1911. Serial No. 657,218.

1,035,913—Shock Absorber for Vehicles. Charles T. Schoen, Media, Pa. Filed November 6, 1911. Serial No. 658,722.

1,035,937—Carbureter. Lars Anderson, Chicago, Ill. Filed October 15, 1909. Serial No. 522,710.

1,035,938—Air Valve for Carbureters. Lars Anderson, Chicago, Ill. Filed May 21, 1910. Serial No. 562,618.

1,035,943—Spoke Socket. Lawrence Allen Bradford, Flemingsburg, Ky. Filed March 14, 1912. Serial No. 683,793.

1,035,774—Valve Spring Releaser and Retainer. Edwin N. Kraemer, Cedarburg, Wis. Filed May 24, 1911. Serial No. 629,244.

1,036,016—Tire. Ernest Siegel and Jacob Ruppert, Jr., New York, N. Y. Filed November 20, 1911. Serial No. 661,234.

1,036,018—Vehicle Shield. George L. Smith, Washington, D. C. Filed April 27, 1911. Serial No. 623,633.

1,036,020—Tire Holder. Andreas M. Sonnichsen, Milwaukee, Wis., assignor to Auto Parts Manufacturing Co., Milwaukee, Wis., a corporation of Wisconsin. Filed August 31, 1911. Serial No. 646,963.

1,036,023—Automobile Horn. William Edward Stephens, Chicago, Ill., assignor to Aermore Manufacturing Co., Chicago, Ill. Filed July 14, 1911. Serial No. 638,430.

1,036,041—Motor Vehicle. Arthur W. Wall, Birmingham, England. Filed August 7, 1909. Serial No. 511,736.

1,036,043—Fluid Pressure Device. George Westinghouse, Pittsburg, Pa. Filed September 28, 1909. Serial No. 520,039.

1,036,065—Vehicle Tire. Charles W. Blaney, Philadelphia, Pa., assignor of one-half to Clara Blaney, Philadelphia, Pa. Filed February 27, 1911. Serial No. 610,992.

1,036,071—Fluid Pressure Steering Apparatus. Edward E. Bryant, Chicago, Ill. Filed August 5, 1910. Serial No. 575,778.

1,036,085—Inflating Tube Protector. Clarence E. Falor, Akron, Ohio, assignor to the Goodyear Tire and Rubber Co., Akron, Ohio, a corporation of Ohio. Filed October 31, 1911. Serial No. 657,850.

1,036,097—Spring Wheel. Bennie P. Hanson, Elmore, Minn., assignor of one-half to Charles D. Williams, Elmore, Minn. Filed November 17, 1911. Serial No. 660,777.

1,036,115—Switch-Lock for Ignition Circuits. Philip Hoffman and Theodore H. Huffer, St. Louis, Mo. Filed February 23, 1912. Serial No. 679,532.

1,036,119—Power Transmission. Samuel Hughes, Lindsay, Ontario, Canada. Filed May 19, 1910. Serial No. 562,202.

1,036,133—Gas Mixer and Regulator. Garnet Wolesley McKee, Rockford, Ill., assignor to Eclipse Fuel Engineering Co., Rockford, Ill., a corporation of Illinois. Filed December 12, 1910. Serial No. 597,003.

1,036,134—Friction Gearing. James A. McLaughlin, Odum, Ga. Filed February 1, 1912. Serial No. 674,646.

1,036,143—Terminal for Igniters. Ross M. G. Phillips, Minneapolis, Minn., assignor, by mesne assignments, to Henry Deutsch, trustee. Filed February 21, 1911. Serial No. 610,042.

1,036,164—Brace for Vehicle Tops. Joseph Teppert, Buffalo, N. Y. Filed May 5, 1911. Serial No. 625,221.

1,036,186—Automobile Gearing Lock. John H. Bull, Indianapolis, Ind. Filed July 26, 1911. Serial No. 640,691.

1,036,188—Resilient Antifriction for Vehicle Wheels. Courtland G. Capwell, Roslindale, Mass., assignor of thirty-seven one-hundredths to Fred Rawwitser, South Acton, Mass., and twenty-five one-hundredths to John H. Moore, Boston, Mass. Filed February 2, 1911. Serial No. 606,103.

1,036,213—Explosive Engine Starter. Charles Henry Freeman, Bloomington, Ill. Filed January 27, 1911. Serial No. 605,080. Renewed July 3, 1912. Serial No. 707,610.

1,036,216—Lubricator. Henry Gibbs, Chicago, Ill., assignor to W. D. Allen Manufacturing Co., Chicago, Ill., a corporation. Filed January 10, 1910. Serial No. 537,223.

1,036,247—Vehicle Spring. George M. Huston, New York, N. Y. Filed May 25, 1912. Serial No. 699,654.

1,036,251—Pneumatic Rubber Tire Protector. John F. Johnson, Jamestown, N. Y. Filed March 25, 1912. Serial No. 686,138.

1,036,259—Car Fare Register. James Alexander Keyes, New York, N. Y., assignor, by mesne assignments, to the Columbia Motor Car Co., Hartford, Conn., a corporation of Connecticut. Filed July 7, 1899. Serial No. 723,015.

1,036,288—Gaseous Power Generator. Giuseppe Matricardi, Pallanza, Italy. Filed March 6, 1911. Serial No. 612,720.

1,036,301—Carbureter. Harry A. Miller, Los Angeles, Cal. Filed October 19, 1910. Serial No. 587,985.

1,036,302—Auxiliary Air Attachment. Harry A. Miller, Los Angeles, Cal. Filed November 14, 1910. Serial No. 592,354.

1,036,307—Controlling Device for Motor Vehicles. Frederick P. Nehrbas, Charles Pleuthner and George S. Salzman, Buffalo, N. Y., assignors to E. R. Thomas Motor Company, Buffalo, N. Y., a corporation of New York. Filed December 22, 1906. Serial No. 349,084.

1,036,321—Explosive Engine. Winfield P. Pembroke, Rochester, N. Y. Filed August 12, 1909. Serial No. 512,619.

1,036,334—Pneumatic Power Transmission. Frank Monroe Prather, Los Angeles, Cal. Filed April 12, 1911. Serial No. 620,692.

1,036,337—Radial Pitman for Multiple Cylinder Engines. Charles Benjamin Redrup, Cardiff, England. Filed June 15, 1911. Serial No. 633,333.

1,036,340—Cushioning Device. Albert F. Rockwell and Charles F. Schmelz, Bristol, Conn., assignors to the New Departure Manufacturing Co., Bristol, Conn., a corporation of Connecticut. Filed February 23, 1906. Serial No. 302,652.

1,036,341—Dirigible Headlight. Albert Roesgen, Geneva, Switzerland. Filed October 5, 1911. Serial No. 652,910.

1,036,342—Horn or Whistle. James B. Rogers, Chicago, Ill., assignor of one-half to Carl E. Westcott, Chicago, Ill. Filed November 19, 1906. Serial No. 343,993.

1,036,349—Hose Coupling. Carl C. Schultz, Victor, Iowa. Filed December 16, 1911. Serial No. 666,176.

1,036,356—Distributor for Electric Ignition Gear. Frederick R. Simms, London, England, assignor to the Simms Magneto Co., New York, N. Y., a corporation of New York. Filed January 16, 1911. Serial No. 603,012.

1,036,360—Band Brake. Charles F. Smith, Bridgeport, Conn. Filed August 23, 1911. Serial No. 645,640.

1,036,396—Three-Wheel Motor Driven Vehicle. William H. Williams, Statesboro, Ga. Filed January 20, 1912. Serial No. 672,421.

1,036,424—Pump Feeding Mechanism for Internal Combustion Engines. Louis Henri Libert Belem and Gaston Jean-Baptiste Bregeras, Neuilly-sur-Seine, France. Divided and this application filed November 18, 1911. Serial No. 661,131.

1,036,451—Explosive or Internal Combustion Engine. Anthony B. Casper, Kingston, Pa. Filed September 3, 1908. Serial No. 451,569.

1,036,455—Pneumatic Tire. John H. Clune, Springfield, Mass. Filed December 9, 1910. Serial No. 596,433.

1,036,480—Traction Engine. Henry Ford, Detroit, Mich. Filed May 24, 1909. Serial No. 497,869.

1,036,484—Automobile Cooler. Robert L. Glass and Harry S. Walker, Corvallis, Oreg., said Walker assignor to said Glass. Filed December 16, 1910. Serial No. 597,698.

1,036,493—Pneumatic Tire. Barton Berkley Hill, London, England. Filed September 6, 1910. Serial No. 580,564.

1,036,503—Internal Combustion Engine. Herbert McCornack, West Chester, Pa. Filed August 21, 1906. Serial No. 331,514.

1,036,517—Rubber Tire. Jesse J. Beitler, New York, N. Y., assignor to Henry C. Beitler, Chicago, Ill. Filed September 22, 1911. Serial No. 650,754.

**AERMORE Exhaust Horn**—No. 1,036,023—William Edward Stephens, Chicago, Ill., assignor to Aermore Mfg. Co., Chicago. Filed July 14, 1911, dated Aug. 20, 1912. Relating to improvements in the construction of this horn, about which there has been recent litigation, this patent consists of a resonant group of pipes, dis-

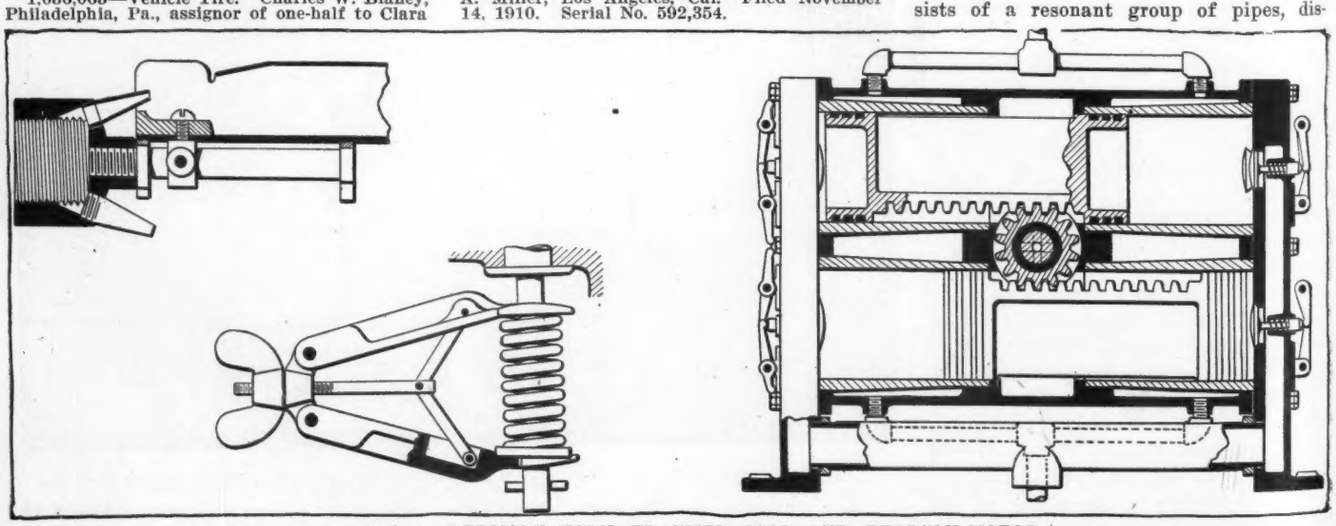


FIG. 1—AERMORE HORN, KRAEMER TOOL, AND PEARSON MOTOR

posed longitudinally about the end of a central nozzle tube, which is provided with four nozzle tips, which discharge the gases into the four pipes, and to a mounting of the component parts of the assembly consisting of a boss, mounted on the central tube, to which each of the pipes are screwed, and of a flange carried by the central tube, which is formed with concave depressions for the reception of the pipes. The action of this signal is by resonance as induced by the injection of columns of exhaust gas projected into the mouths of the pipes by the nozzle group.

**Antique Taximeter Drive**—No. 1,036,259—James Alexander Keyes, New York, N. Y., assignor, by mesne assignments to the Columbia Motor Car Co., Hartford, Conn. Filed July 7, 1899, dated Aug. 20, 1912. After lying in the patent office for thirteen years, patents have been granted on a driving means for taximeters, whose chief interest is its antiquity.

The purpose of the device is to provide a traction driven distance recorder with a synchronized control whereby it would automatically be thrown into fare registration at the movement of the vehicle, and be thrown out of action, a motor driven time recorder taking its place in the registration of tariff, upon the cessation of the vehicle's motion. Means are also provided for throwing the latter out of operation, for non-productive waits or movements.

**Crankless Motor**—No. 1,035,899—John R. Pearson, New York, N. Y., assignor, by mesne assignments, to Pearson Reciprocatory Motor Co., New York. Filed Oct. 1, 1911, dated Aug. 20, 1912. The Pearson patent relates to the method of transforming the primary reciprocatory movement induced by the motor impulse into final rotary motion. Comprising a multi-cylinder opposed motor, the opposite cylinders having within them a single, common double-headed piston, the invention consists of racks on the adjoining sides of the pistons, between pairs of which are gear pinions, adapted to be oscillated by their motion, and to impart a differential motion to their respective strokes, thus balancing perfectly, and permitting a very compact construction. The oscillatory motion of the shaft to which the pinion is fixed is transformed into rotary motion, by means of a suitable, unspecified mechanism, the nature of which is not covered by this patent.

**Valve Spring Tool**—No. 1,035,974—Edwin M. Kraemer, Cedarburg, Wis. Filed May 24, 1911, dated Aug. 20, 1912. This tool is adapted for use either as a spring compressor, expander, or demounter, and may also be used as a valve lifter. It is composed of two jaws pivoted parallel to one another, having bifurcated, or slotted jaws, between which two links are pivoted, in a manner similar to a lazy tong, their joint being connected to a threaded rod, which is acted upon by a thumb screw to expand or contract these toggle levers, thereby closing or opening the jaws of the device.

**Ford Gasoline Tractor**—No. 1,036,480—Henry Ford, Detroit, Mich. Filed May 24, 1909, dated Aug. 30, 1912. Simplicity is the keynote to this patent, the frame being composed of the motor, motor bed and crankcase, and gear housings. The tractor is of the four-wheel type, driving a pair of rear wheels of relatively large diameter, and steering by a pivotal front axle, supplied with small diameter wheels. The frame is rigidly attached to the rear axle. The motor is horizontally disposed over the forward axle, driving an exterior belt pulley, and carrying its cooling apparatus above it.

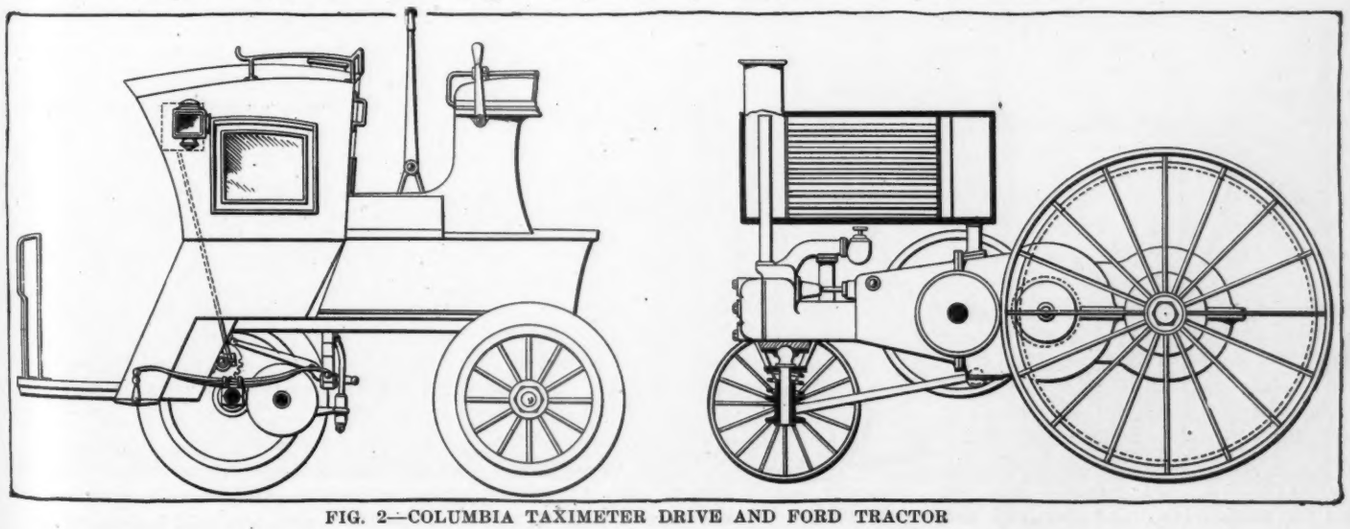


FIG. 2—COLUMBIA TAXIMETER DRIVE AND FORD TRACTOR

# The Motorists' Bookman

### The Production of Rubber

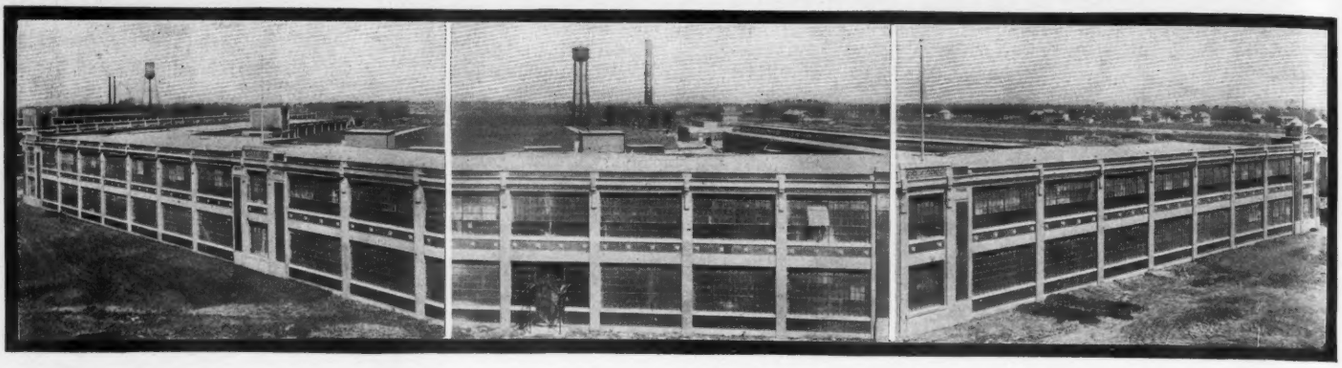
WITH a view to dispelling, to some extent, the appalling ignorance on the part of most laymen, of the methods of production of one of our principal industrial materials, "Rubber," by Edith A. Brown, one of her "Peeps at Industries" series, is published by Adam and Charles Black, London, the MacMillan Co., of New York, being the American agent. This subject is treated in a non-technical way, and for that reason commends itself to those who neither have the time nor the preparation to read a treatise of deeper nature. To make the study of a great industry, affecting every resident of the earth, and which to most people is astonishingly obscure; a subject of interest and profit to the average reader, is surely a laudible mission, and in this example the result has been accomplished in a most entertaining manner.

The industry is treated in an intimate and first-hand manner, the methods of production in Brazil, Peru, Central America, Mexico, Africa, Bolivia, Malaya and India are fully described and illustrated with twenty-four full page photo engravings. Also methods of manufacture are briefly touched upon, and the labor conditions and life in the rubber districts. The book is attractively bound in blue cloth and sells for 37 cents net.

### Inter-State Guide

"The Inter-State Automobile Guide" in leaflet form gives a number of routes radiating from the western end of Lake Erie, with either Detroit or Toledo as the axis. It is published in two editions, namely, the Detroit edition and the Toledo edition. The mappings range from Cleveland on the east to Chicago on the west, and from Cincinnati as far north as Grand Rapids. A half a dozen or so route maps are given, together with running directions. It is issued by United Garage Co., Toledo, O., and published by the Lorenz Publishing Co., Detroit, Mich.

# Among the Makers and Dealers



FACTORY OF THE CONTINENTAL MOTOR MFG. CO., MUSKEGON, MICH.

**FORD Increases Canadian Plant**—Additions are being made to the plant of the Ford Motor Co. at Walkerville, Ontario, and when completed this factory will have a floor space of 1,250,000 square feet.

**Davidson Goes to Detroit**—M. D. Davidson, formerly with the Boston branch of the Oldsmobile and also the R. C. H. sales force in the hub, has gone to Detroit to accept a position as district sales manager with the R. C. H. company.

**Foreign Shipment Daily**—During 8 days ending August 21 the Clark-Carter Automobile Co. has averaged one foreign shipment of Cutting cars per day, three of these shipments going to Austrlia, three to New Zealand, one to Brazil, and one to Italy.

**Ewing Resigns**—A change has been effected in the publicity and advertising department of the Nyberg Automobile Works of Anderson, Ind., due to the resignation of Oscar R. Ewing as head of the department. Ewing returns east for the purpose of completing his course in the Harvard law school. The vacancy has been filled by C. A. Lawrence.

**Indianapolis Garagemen Organize**—An association is being formed by the garage keepers of Indianapolis, which will be distinctive from any of the other motor car associations of the city. Temporary officers are Will Blair, of the Delaware garage, chairman, and Oliver G. Thomas, of the Midway Auto Co., secretary. A permanent organization will be completed in the near future.

**New Parts Plant for Indianapolis**—A two-story, fire-proof factory building, in which will be manufactured brass and aluminum motor car castings, is being erected in Indianapolis by the Keyless Lock Co. The new plant will occupy a site of one and one-half acres at Sheldon street, and the Indianapolis Union railway tracks and will cost about $75,000. It will be daylight plant, with the most modern equipment available. Oil furnaces will be used for melting brass and aluminum and there will be large gas ovens for the baking process. The plant, which will have a capacity of 10,000 pounds of castings daily, will be completed November 1.

**Wilson Body Grows**—An addition is being made to the plant of the Wilson Body Co. The new structure is to be five stories in height and will contain 65,000 square feet floor space when completed.

**Mayer Carbureter to Move**—The Mayer Carbureter Co., Buffalo, N. Y., is laying plans to move its factory to Detroit. This company has been represented in this city by Edward Richards, its technical man, and is now about to open a Detroit office in charge of H. Vortcamp.

**Firestone Plans Expansion**—Plans have been made to increase the capacity of the Firestone Tire and Rubber Co. plant at least 25 per cent. The Firestone company also will build a fireproof employment office to cost $13,000. Another large factory building is to be added to the present group.

**New Truck Concern**—The Brockway Motor Truck Co., of Cortland, N. Y., capitalized at $100,000, was incorporated at Albany, N. Y., last week. Directors of the new concern are George A. Brockway, Charles S. Pomeroy and Frederick R. Thompson. The new motor company is to make a specialty of light motor commercial vehicles, but 1, 2 and 3-ton trucks will be manufactured as the business increases.

**Rush at Bearings Plant**—The plant of the New Departure Mfg. Co., at Bristol, Conn., making New Departure ball bearings, is working 127 hours a week in all departments and 152 hours a week in some departments, with day and night shifts of skilled mechanics. Further increased business has been provided for by factory additions now in process of construction. These additions will give nearly 75,000 square feet of floor space, which will be available late in the fall of the present year. Three outside machine building plants and the company's own extensive manufacturing machine shop are busy on special mechanical equipment for the new buildings.

**To Manufacture in Wyandotte**—The Keeton Motor Car Co. is installing machinery at the Wyandotte plant and will start manufacturing in September and will give deliveries in October. The company has arranged an exhibition for the Toronto exposition.

**Concrete Factory for Ware Company**—The Ware Motor Vehicle Co. is building a four-story concrete factory at Raymond and University avenues, St. Paul. It is to be 90 by 200 feet and cost $35,000. L. E. Roberts is president and J. L. Ware is general manager. The company is building a four-wheel-drive car.

**Continental Trucks on Market**—The Continental Motor Truck Co., of Superior, Wis., a new commercial vehicle industry of the northwest, has turned out the first lot of Continental trucks and is now preparing for the regular run. The company is owned principally by E. M. Anderson and Dr. John Barnsdale, of Superior. Dr. Barnsdale built the first motor car to be propelled by a gasoline engine in Wisconsin as far back as 1892. He is the designer of the truck and Mr. Anderson is superintendent of the works.

**Marion Names Four Sales Managers**—In connection with the active sales department which the Marion Motor Car Co. is now organizing, there have been appointed four district sales managers. These men are C. H. Tyler, who has just resigned as manager of the United States Motor Co.'s Cleveland branch; C. B. Riggs, who gives up the management of the Oldsmobile branch in Kansas City; W. W. McClure, who has been associated with the Marion interests in Texas, and Howard W. Harrington, who has been in charge of the Marion on the Pacific slope. The new district managers will supervise the territory between the Allegheny mountains and the Pacific ocean, and will be under the

direction of F. G. W. Sudrow. They already are at work upon an active campaign in their several districts, and connections are being established in the more important cities as rapidly as possible throughout the territory.

**Case Building Service Branch**—It is reported that the J. I. Case Threshing Machine Co., of Racine, Wis., will erect a large branch house and service building in Milwaukee before the end of the year. At present Milwaukee business is being carried on through the Madison branch of the Case company in charge of C. M. Doring, with C. R. Kilbourne as city representative.

**Goodrich Plans New Building**—The B. F. Goodrich Co. has plans for a new office building at Akron, O., to cost $100,000. The new office building will be used by both the Goodrich and the Diamond companies. It has been intimated that a reorganization of the office force will take place soon. It also is said that sweeping changes are to be made in the sales departments.

**Morrow Adds to Force**—Although there are now 928 skilled mechanics employed in the Elmira, N. Y., plant of the Morrow Mfg. Co., makers of transmission, automatic screw machine parts and ball bearings for the Indianapolis and Toledo, O., Willys-Overland factories, additional men are daily being put to work to keep up with constant demands for materials from those factories for Overland cars.

**Ford Makes Record Shipment**—What is said to be the largest shipment of motor cars ever made recently left Detroit for Kansas City. In the shipment were 630 complete Ford cars. The most striking feature of this shipment is the fact that the 630 Fords were all packed in twenty-four freight cars. There were two cars of dashes, one car of radiators, six cars of motors, nine cars of frames, one car of wheels, three cars of fenders, one car of tanks and one car containing miscellaneous parts. Every inch of space in the freight cars was utilized in packing the shipment. Had the cars been assembled before shipment, they would have filled 210 freight cars. The value of the shipment was approximately $434,700. The vehicles will be assembled at the Kansas City branch.

**Columbus Electrics in Boston**—The Columbus Buggy Co., of Columbus, Ohio, has entered into a contract with Tyler Bros., of Boston, Mass., to furnish that concern with 100 Columbus electrics for distribution in New England.

**To Build 11,000 Cars**—George E. Daniels, vice president and general manager of the Oakland Motor Car Co., of Pontiac, Mich., is authority for the statement that his company will turn out 11,500 cars for 1913. For the coming year a six-cylinder model and a car at $1.075 have been added to the line.

**Cutting Plant Nearly Ready**—The Clark-Carter Automobile Co., of Jackson, Mich., manufacturer of Cutting motor cars, has practically completed its large and extensive four-story addition to the present plant. The completion of this new building will relieve the present congested condition of the factory and will permit production to be doubled.

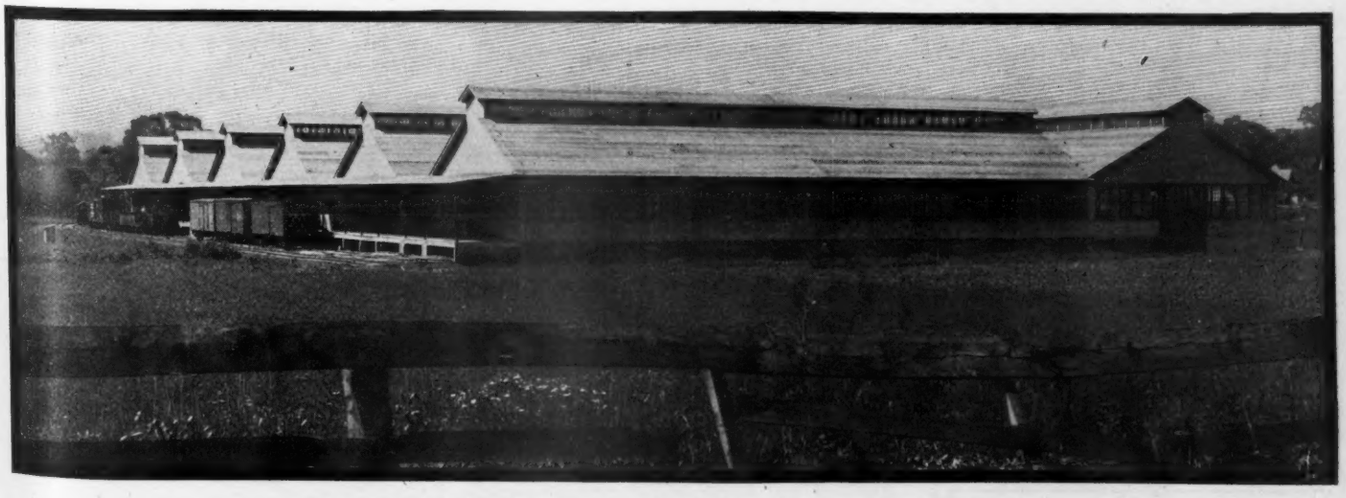
**Changes in Packard Staff**—Changes have been made in the staff of the Packard Motor Car Co. recently. Russell Huff has been made consulting engineer, J. G. Vincent chief engineer; George R. Bury, manager motor carriage sales department; S. Loomis, manager specifications department; C. R. Norton, manager of truck sales. C. E. Morton will be assistant in the truck sales department.

**Timken Adds to Plant**—The Timken Roller Bearing Co. is adding to its Canton, Ohio, plant a modern grinding shop, 64x240 feet. Saw tooth roof, steel window sash, side walls, steel frame and solid concrete floors feature the fireproof construction. The new building will be heated by the blower system, all pipes under ground. In the summer time the heating plant will be utilized to circulate cold air through the grinding room. Perfect ventilation is provided for and the factory is flooded with light. New machinery to grind the Timken cups, cones and rolls will be installed on concrete foundations. The building will be ready for occupancy November 1.

**New Truck Company Formed**—The latest truck concern to be formed in Detroit is the Standard Motor Truck Co., which has just been incorporated for $50,000. Howard Wilcox, who has been connected with the Kelsey Wheel Co., and W. K. Ackerman, assistant manager of the Reliance Motor Truck Co., are the leaders in the new company. The Standard company has secured a factory at 973 Bellevue avenue 35 by 140 feet in size. The truck to be manufactured will be 3 tons capacity and will be a standard, conventional truck in every way. A Continental motor will be used in the new truck.

**Jeffrey Dewitt Increases Plant**—The Jeffrey-Dewitt Co. has started the construction of a three-story addition to the plant at Butler avenue and the Grand Trunk railroad, Detroit, and also a one-story addition of the saw tooth style of construction. The three-story structure will be 64 by 100 feet in size and the one-story addition will be 52 by 100 feet. These additions will enable the company to triple the output and manufacture 3,000,000 spark plugs this year. The present factory building will be turned into a pottery and the mechanical work will be done in the two new buildings.

**Truck Maker Builds Railway Car**—The Motor Conveyance Co., of Milwaukee, Wis., manufacturing the B. O. E. commercial vehicle, has just completed a car which is of the size of the ordinary electric street car, but is propelled by a gasoline motor, the power being transmitted to the axles by means of a double friction drive. No trolley or trolley wires are needed, and the car will run on any standard gauge track. One of the first models is now being given exhaustive tests on a New Jersey interurban railway. It has a capacity for thirty-two persons and weighs 42,000 pounds, with a tractive capacity of 200,000 pounds draw-bar pull.



THE NEW FACTORY OF THE PENN MOTOR CAR CO., NEW CASTLE, PA.

# Development Briefs

## Springless Air-Valve on New Carbureter—Extensive Rear Sight Mirror—Utility Tool—Compact Folding Chairs

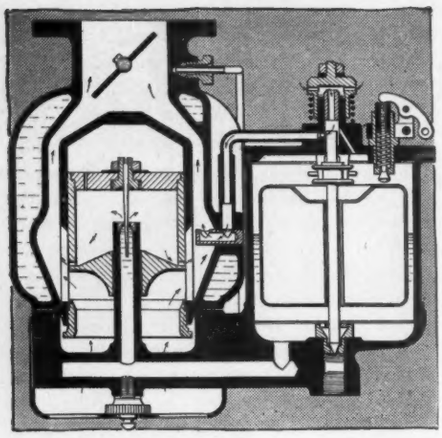


FIG. 1—NEWCOMB CARBURETER

**Newcomb Piston Type Carbureter**

WITHOUT springs of any description in the air-valve arrangement, the Newcomb carbureter is designed to provide a mixture correct under all operating conditions, with the maximum of flexibility and the minimum of complexity of parts or adjustment. It is made by the Holtzer-Cabot Electric Co., Brookline, Mass. The device uses the usual two-part body, as shown in Fig. 1, consisting of a float chamber and a mixing chamber. The float chamber differs little from standard, having a metal float, and needle supply valve adjustable by means of a thumb-nut at the top of the chamber. This thumb-nut is provided with passages for the admission of the fixed air supply, which is lead into the combustion chamber through a tube and air nozzle. The gasoline is lead from the float-chamber to a vertical standpipe, in the center of the main body, surmounted by a needle-valve nozzle. Air is taken in below and around this stand-pipe, and deflected to the annular mixing chamber by the bottom of the floating piston valve, that constitutes the feature of this carbureter. This piston is vertically disposed within an inverted cylinder, which forms the core of the main body, and acts as a dash-pot to render its movements positive and steady. A small hole is drilled in the piston head, to relieve the compression in this cylinder, which leads to the spray chamber which composes the interior of the piston. The lower portion of the piston slides upon the stand-pipe, and is so formed on its lower surface as to render the passage of air upward from the intake free. Attached to the piston head by an adjusting nut, a needle valve extends downward through the spray chamber to its seat at the top of the gasoline nozzle.

In operation, the suction of the engine as the throttle is opened, raises the floating piston, admitting more gasoline into the spray chamber, from whence it is drawn as vapor through openings at the base of the piston, into the mixing chamber. The rising action of the piston, furthermore enlarges the air-inlet area, and raises the vapor outlets in proportion, thus always injecting the vapor above the column of air, ensuring a homogenous mixture, and the minimum of condensation. A collar at the bottom of the combustion chamber, above the gasoline line, is provided for idling adjustment, and when once adjusted for a certain motor, never need be changed.

The carbureter is liberally water-jacketed, and for starting is equipped with a priming plunger and an auxiliary nozzle, located in the throat, which is automatically cut out, when the throttle is opened. Adjustment of the mixture is made entirely from the dash, an indicator on the float chamber cover, showing the adjustment at all times.

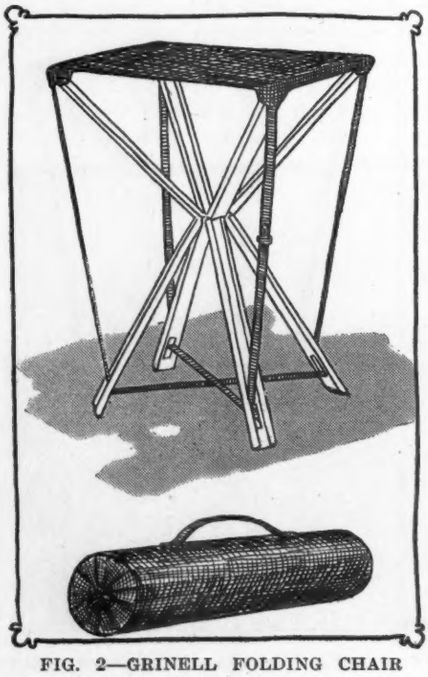


FIG. 2—GRINELL FOLDING CHAIR

**Hoco Windshield Mirror**

Manufactured by Hoeft & Co., Inc., Chicago, the rear sight mirror shown in Fig 7, is a device, having an oval bevel plate mirror, 6 by 8 inches and an improved extension which permits it to be extended 13¼ inches from center of mirror to center of clamp. It is finished in either brass or nickel, and may be adjusted to any angle. It is furnished with either a clamp or screw-plate.

**Convenient Utility Tool**

Combining the functions of drill jig, hand vise, clamp for vulcanizing, etc., light jack, valve-lifter, spring-stretcher, or compressor, hand wrench, hand vise, running-board vice, etc., the Utility tool shown in Fig. 4, and manufactured by B. Morgan, at Newport, R. I., is offered. It is light and compact, and yet substantially made, consisting of a foot, to which a square-threaded upright is fixed, on which a nut turns. This nut is placed within a yoke which is part of a movable clamp, which, like the foot, is slotted for use as a wrench. A ratchet lever operates on the nut, and is free to turn in an arc of 240 degrees. The tool is made of steel except the nut, which is of hard brass, and therefore rust-proof. Two sizes are offered to motorists.

FIG. 3—FAVORITE HOOD

**Truett Indicator**

N. H. Truett, of Toronto, Canada, has invented an indicator, which is shortly to be manufactured by a limited company in Toronto. This device is designed to be applied to both front and rear of the car, in the form of dials, showing the direction next to be taken by the car, and indicating the driver's intention to stop. The dial of this indicator is from 12 to 14 inches in diameter, with warning of the intention of the driver to turn to the right, left, or to stop, painted upon the surface, and indicated at night by means of electric lights of red, green and white. The device is controlled by a foot switch, and is equipped with a miniature indicator on the dash. It is claimed that the

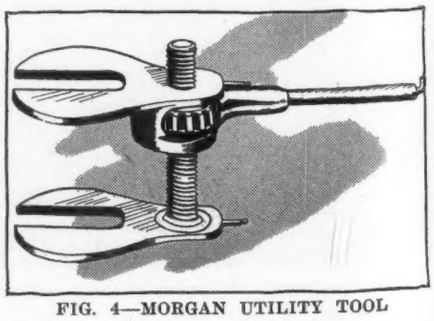


FIG. 4—MORGAN UTILITY TOOL

# Novelties for Motoring

## Vacuum Cleaning System for Motor Cars—Neat Head-Gear for Fair Motorists—New Exhaust Signal—Hose Union

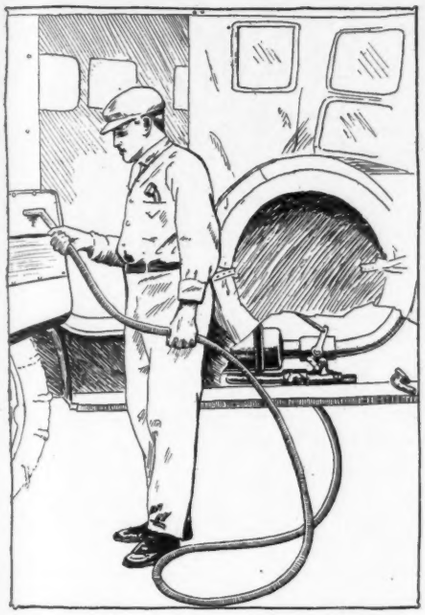


FIG. 5—MOTOR CAR VACUUM CLEANER

operation of the indicator does not interfere with the operation of the car, as its warning is given a minute or so before the actual movement indicated is performed. It is shown in Fig. 6.

**Glendale Folding Chair**

"Always room for one more" is a maxim that is often applied to the seating capacity of motor cars, but many and varied are the means of accommodating the passenger in excess to the rated seating capacity. The chair shown in Fig 2, which is manufactured by the Glendale Mfg. Co., of New York, offers comfortable accommodation to an extra guest, without taking up too much room when not in requisition. It is constructed on a steel framework and has a heavy duck seat, and while it is amply strong to support 400 pounds, it weighs but 2. It is especially interesting in view of the very small package it makes when folded, being about the size and shape of an ordinary music roll. In folding the canvas seat is removed, when the members of the framework fold into a compact bundle, around which the seat is rolled, being tied by a cord which is attached.

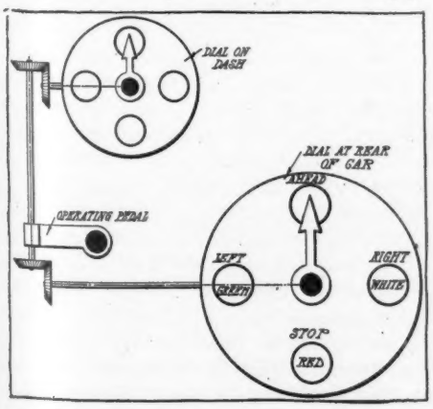



FIG. 6—TRUETT REAR SIGNAL

**Motoring Hood**

A practical knitted motor hood for women motorists is manufactured by the Favorite Knitting Mills of Cleveland, Ohio. The hood illustrated in Fig. 3 is of fiber silk. These hoods cover the entire head and protect the head from dust and wind. They are durable and warm in cold weather and come in a variety of shades and colors. Other models are in mercerized cotton, wool and silk.

**Aermore Exhaust Chime**

The Aermore Mfg. Co., of Chicago, has produced the exhaust signal illustrated in Fig. 8. The Aermore exhaust horn consists of a junto of four tubes, which are blown upon through a series of flattened ducts, mounted on a dome-shaped head. This head is attached to a suitable valve, which taps the exhaust pipe. There are no reeds or mechanical appliances and the gases have a straight, free passage through the tubes, and hence will not clog, it is said. The horn is controlled by a pedal on the footboard and the tone may be made loud or low by opening or closing the throttle.

The device is simple and well constructed. The latest models are machine-made, and with the following improvements: A hexagon nut is used on the head, facilitating its attachment; a steel rod is used as an anchor core for the tubes, and an improved manner of anchoring the tubes to the core is used, which consists of two plates to which the tubes are unionized, and through which the core runs for retaining them.

**Auto Vacuum Cleaner**

Manufactured by the Auto Vacuum Cleaner Co., Milwaukee, Wis., the device illustrated in Fig. 5 is an attachment to the exhaust line of any gasoline motor car that permits the car to be cleaned at small cost and effort, and in a very short time. The device consists of a coupling that is inserted into the exhaust pipe above the muffler in the same way as a cut-out, and which is provided with a valve, which admits the gas to the muffler or ejects it from the device. This ejection is through a suitably designed nozzle, so that behind the nozzle there is a strong suction. An opening at this point is connected to the cleaning hose which is equipped with the customary tools. The dirt and dust is thus blown out through the ejector beneath the car. There are

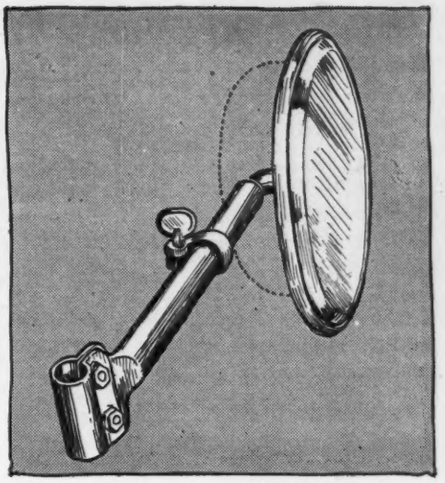


FIG. 7—HOCO REAR-VIEW MIRROR

no moving parts to the Auto-Vac, as the device is called, and it occupies but little space. The equipment includes the exhaust pipe attachment, a suitable length of suction hose, and two attachments.

**Safety Hose Connector**

To prevent over-inflation, due to the delay occasioned, with the use of the usual hose connection, by the necessity of returning to the stop-cock at the tank, to shut off the air or gas, when using compressed air or tire-gas, the Gleason-Peters Air Pump Co., of Brooklyn, N. Y., offers a neat hose connection that is equipped with a stop-cock that may be instantly shut off at the crucial moment. It is small and compact, and easily attached.

It may be attached to any pump or air bottle, in the usual manner.

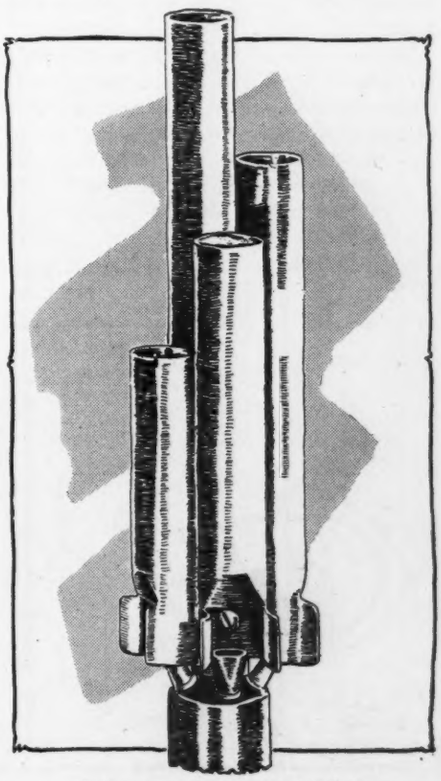


FIG. 8—AERMORE SIGNAL

# The Start-Lite Junior

## New Automatic Appliance Regulates and Ignites Gas for Headlights with One Lever

OF unusual simplicity, compactness, and neat appearance, the Start-Lite Junior gaslighter for motor cars has just entered the accessory field. This lighter operates on the same principle as the previous Start-Lite lighters, but is constructed on much simpler lines. As shown in Fig. 11, in appearance it resembles a kick-switch, and may be applied in a similar position on the dash. It is shown in

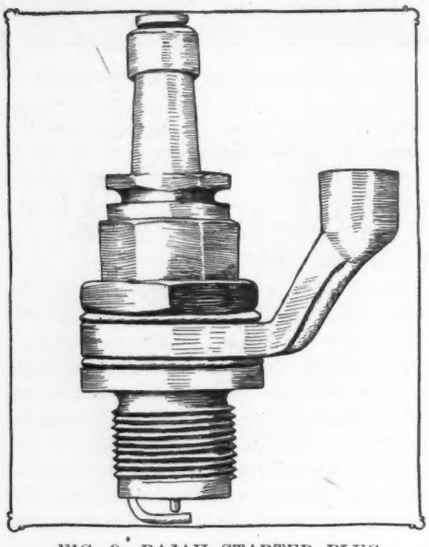


FIG. 9—RAJAH STARTER PLUG

one part of the figure with the cover removed showing the working parts, and a reverse view is shown, with the connections.

The function of this device is to control the admission of gas to the lamps, electrically igniting it when turned on, and cutting out the ignition when the gas is lighted. This is accomplished by means of a single lever, connected to a one-way gas valve and operating at certain positions a spring wedge-switch.

In operation, with the lever in off position, to light the lights, the lever is raised slightly and moved to the extreme right. This turns on the gas and closes the sparking circuit. As soon as the lamps are lit, a touch on the controller handle releases the pin from its engagement with the outer edge of the slot, and permits the lever to spring out, breaking the circuit. The lamps may then be dimmed or extinguished by moving the lever to the left.

### Rajah Self-Starting Plug

Originally manufactured expressly for the Prest-O-Lite starter, the Rajah self-starter plug, shown in Fig 9, is now being placed upon the accessory market. This plug has a shoulder at its lower end on which a yoke rests. This yoke is held in place by a jam nut, to make it gas-tight. The yoke is hollow and is provided with a connection to the gas lead. The passages in the yoke lead through a groove in the shell, into the cylinder. The plug otherwise is practically identical with the regular Rajah plug, using the knife-edge bushing and standard porcelain, with an extra long wire. The plug may be removed for cleaning without disturbing the gas connections, or removing the shell from the cylinder. It is furnished in sizes of ½ and ⅞ inches by 18 pitch.

### Intake Pressure Pump

As a remedy for the decrease in volume of the indrawn charge of a gasoline engine, proportionate to its speed, which has been recognized as an inherent fault in present motor design, Gardner S. Chapin, of Chicago, has secured patents on a variable pressure pump, in combination with a gas engine, whose purpose is to maintain an approximately uniform volume of the intake at all speeds, by means of increasing the manifold pressure in proportion to the increase in revolutions per minute of the engine.

This device, shown in Fig. 10, consists of a rotary pump, interposed between the carbureter and the intake manifold, which is geared to the engine shaft, and provided with a by-pass for the purpose of cutting it out at low speeds. This by-pass is provided with a throttle, to reduce the flow through it at high speeds. A governor affixed to the shaft is so linked to this throttle as to close it at high speeds and open it at low.

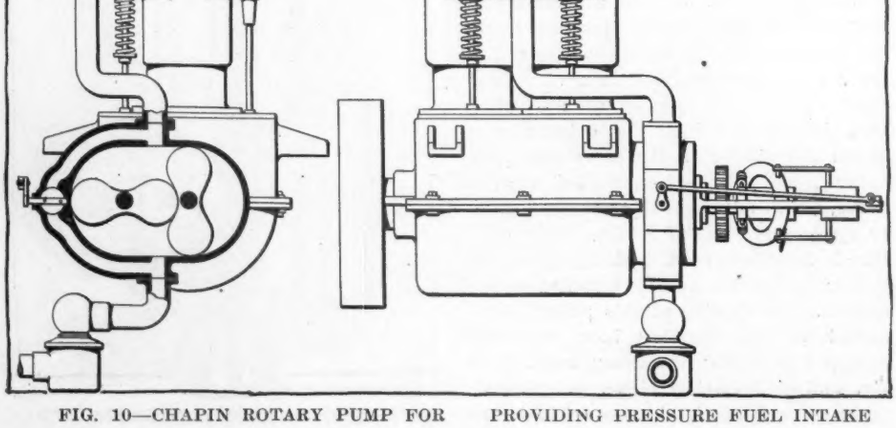


FIG. 10—CHAPIN ROTARY PUMP FOR PROVIDING PRESSURE FUEL INTAKE

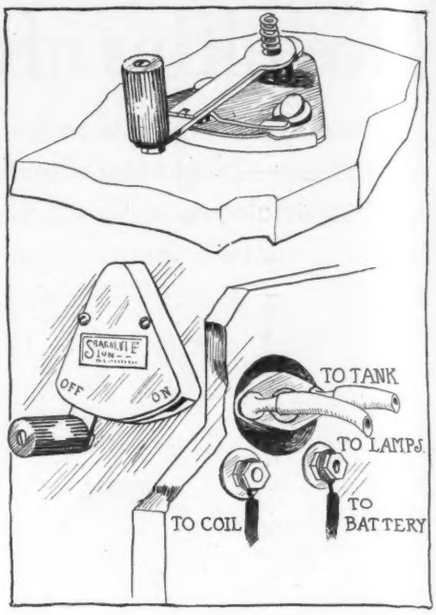



FIG. 11—START-LITE JUNIOR LIGHTER

In operation, the engine is started, drawing in its charge from the manifold in the usual manner, the gas pumped by the pump finding its way back to the pump intake through the by-pass, thus little affecting the pressure in the manifold. As the engine speeds up, however, and the greater speed of opening and closing of the inlet valve admits relatively less charge to the cylinder at a given pressure; the governor actuates the throttle in the bi-pass, forcing part of the pressure generated by the pump into the manifold and allowing only a part to escape through the by-pass. As the speed is still further increased, the throttle is closed still more, until eventually it is entirely closed, and the full pressure of the pump is delivered to the manifold, so that the pressure is great enough to force a full charge into the cylinders, even at the highest speeds. On throttling down again, the pressure is reduced by the opening of the bi-pass reduced by the opening of the by-pass tically at atmospheric pressure. Theoretically, this device would greatly increase the power of a given size of motor.

### Self-Pulling Demontable Wheel

Self-locking and self-pulling, the E-C demountable wheel, manufactured by Ellsworth & Cross, Chicago, is so designed that the whole wheel may be removed at the hub, without disturbing the axle bearings, brake drum, drive shaft connections or hub cap. In Fig. 12 is shown a cross section of the wheel as applied to the hub of a floating rear axle. The wheel, like most of its type, has no hub bearings, those parts being secured to the axle, independent of the wheel itself. This member, the true hub, C, is provided with a tapered surface, and flange, to which the brake drum is bolted. The false hub,

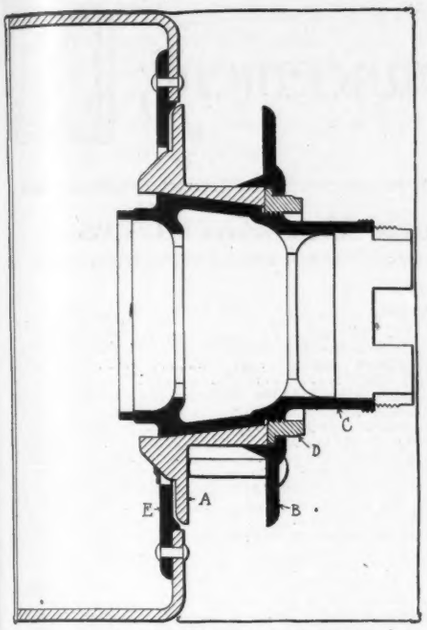



FIG. 12—E-C-DEMOUNTABLE WHEEL

which is secured to the spokes of the wheel, is provided with an inner flange, A, and an outer removable flange B, which fits the wheel hub on a taper. Between this flange and the outer shoulder of the wheel hub is a locking and pulling ring, D, which is threaded to the inner hub, and which, when drawn up secures the wheel hub to the inner hub, and when unscrewed, pulls the wheel from its seat on the taper of the hub. This ring is provided with ratchet teeth on its periphery, in which spring dogs, on the inner hub engage, to prevent the wheel becoming loose from vibration on the road. Two large lugs on the wheel hub flange A, engage with corresponding slots in the hub flange E, to prevent rotation of the wheel on the hub. A special wrench is provided to operate the locking and pulling ring, which automatically releases the dogs on the latter, when the ring is to be removed. Three turns in one direction are sufficient to remove the wheel, and three in the other replace it. The dogs are thrown into action by the wrench in applying the wheel, making it impossible to apply the wheel insecurely.

### Puncture-Proof Pneumatic Tire

Applied to the ordinary rim in the usual manner, the Montgomery resilient tire, which is the patented invention of Harry B. Montgomery, of Harrisburg, Pa., is designed to combine the advantages of a pneumatic tire with those of a solid. As may be seen in Fig. 14, the resilient element consists of a single tube, inflated with air, the inner portion of which is provided with a bead for application to the standard wheel-rim of a motor car, and the outer surface in the form of a v-shaped declivity adapted to receive the solid rubber tread. This tread is of such thickness as to preclude the possibility of a puncture, and owing to its diamond shape, the most pressure is exerted at the center of the pneumatic tube, allowing unlimited side-distension. This construction eliminates the danger of rim-cutting, as the inner edge of the tread element would come in contact with the inside of the tube, before the sides touched the edges of the rim. Upon deflation of the tube, the tread is readily removable for replacement or repair, and owing to its form of contact with the tube, is held securely when the tire is inflated.

### Compact Headlight Turner

The headlight turner illustrated in Fig. 13 is unusual in its neatness and simplicity. The lamps are mounted on brackets differing little in appearance from the standard stationary type, the upright pillars being pivoted, and secured by springs, so as to permit motion without noise resulting from vibration. The interior structure of this oscillatory support is shown in the cutaway view in the figure. The main standard consists of a casting, bolted rigidly to the frame, within which the movable spindle, which supports the lamp fork, is pivoted. A spiral spring holds the spindle down in contact with a dust-proof bearing at the top of the stationary bracket, bearing against a shoulder on the spindle. Below the spring, which is seated on its lower portion against a strap iron bracket, the spindle shank is squared, and arms are disposed thereon. These arms extend behind the columns, and are connected by a tie rod. To one of the brackets is attached an additional control arm, which is connected by means of another rod to the steering arm, as shown. All working parts, with the exception of these two rods, are concealed, and out of the way. H. D. Peters, of Sioux Falls, S. D., is the inventor.

### Fowler Spray Pump

Suitable for washing the car, and adapted to instant requisition in case of fire, a spray pump is manufactured by the Fowler Lamp and Mfg. Co., Chicago, which fits any bucket, and is furnished complete.

## Universal Flag Holder

### Pennant Sockets for Mud-Guards or Windshields Are Adjusted Without Tools

SUPPLYING an increasing demand for a practical contrivance to hold a flag or penant for decorative purposes on a motor car, the J. and J. Mfg. Co., of Detroit, Mich., has brought out two styles of flag holders. These may be applied to any part of the car; they may be clamped to the mudguard, running board, windshield or lamp brackets, and will not mar or scratch the finish. No adjustment is required, as they are made in one piece, and are secured by their own spring. They are

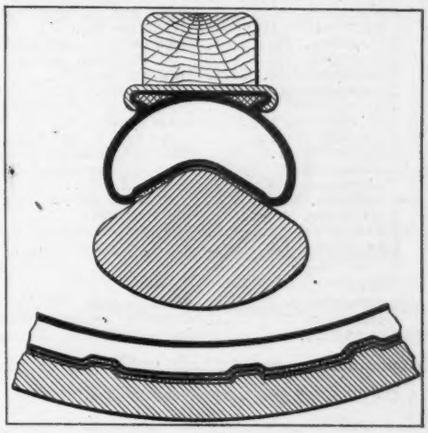


FIG. 14—MONTGOMERY TIRE

made of heavy gauge spring steel, and will hold the largest banner securely in any wind. Vibration cannot effect them, it is claimed, as they have no nuts or screws. Of the two styles, one is adapted to be clamped to the mud guards or running boards, and the other to the windshield or lamp brackets. The former is provided with rubber bearing surfaces and a sliding ring to clamp the flag stick; the latter having two sockets at right angles, which permits the holder to be applied at any angle. They are finished in black enamel.

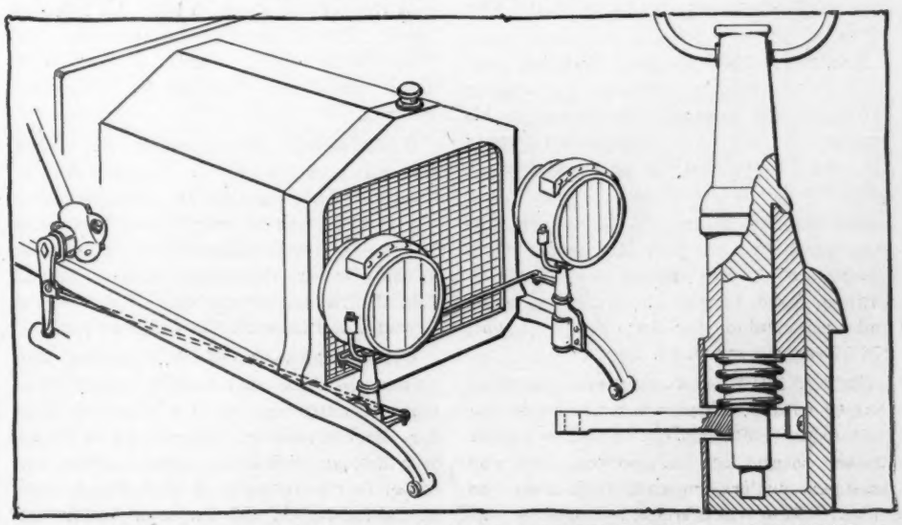


FIG. 13—PETER'S HEADLIGHT TURNER WITH SECTION OF PIVOT CUT AWAY

# Brief Business Announcements

## Recent Agencies Appointed by Car and Truck Manufacturers

### PLEASURE CARS

| Town— | Agent | Make |
|---|---|---|
| Aberdeen, S. D. | Worthington Auto Co. | R. C. H. |
| Alliance, O. | C. O. Scranton | R. C. H. |
| Baltimore, Md. | Colonial Garage Co. | Studebaker |
| Baltimore, Md. | Chesapeake Garage Co. | Kisselkar |
| Battle Creek, Mich. | B. C. Kirkland | Kisselkar |
| Boston, Mass. | Dayton G. True | Krit |
| Boston, Mass. | Frederick A. Dutton | Abbott-Detroit |
| Buffalo, N. Y. | L. G. Schoepflin Co. | R. C. H. |
| Buffalo, N. Y. | Zimmer Motor Vehicle Co. | Henderson |
| Burlington, Vt. | A. F. Lauzon & Co. | R. C. H. |
| Calgary, Can. | Lougheed & Webster | Marmon |
| Chatsworth, Ill. | R. Kloeppel | R. C. H. |
| Columbus, O. | J. Renner | Richmond |
| Columbus, O. | O. G. Roberts & Co. | Garford |
| Davenport, Ia. | Knuppel & Ott | Kisselkar |
| Davenport, Ia. | Davenport Auto Truck Co. | White |
| Des Moines, Ia. | Brown-Corley Motors Co. | Everitt |
| Des Moines, Ia. | Ryan Motors Co. | Marion |
| Dubuque, Ia. | Lippert-Bishop Auto Co. | Kisselkar |
| Easton, Pa. | Shannahan & Wrightson Hdw. Co. | Franklin |
| Jacksonville, Fla. | John G. Gelmers | R. C. H. |
| Kalamazoo, Mich. | W. C. Grace | Kisselkar |
| Kaufman, Tex. | J. C. Bryant | Kisselkar |
| La Crosse, Wis. | Fox Brothers | Kisselkar |
| Lone Tree, Ia. | Zimmerman Steel Co. | Kisselkar |
| Longview, Tex. | W. D. Sessum | Kisselkar |
| Los Angeles, Cal. | J. W. Willcox | Henderson |
| Marshall, Mo. | H. Lowenstein & Co. | Kisselkar |
| Milwaukee, Wis. | Blenheim Garage | Velie |
| Minneapolis, Minn. | Eng Olson | Staver |
| Minneapolis, Minn. | Mercer Motor Sales Co. | Mercer |
| Minneapolis, Minn. | Minnesota Motor Car Co. | Little |
| Nashville, Tenn. | Howard Douglas | Kisselkar |
| Omaha, Neb. | Doty & Hathaway | Reo |
| Omaha, Neb. | Doty & Hathaway | Little |
| Omaha, Neb. | Mitchell Motor Co. | Paige-Detroit |
| Philadelphia, Pa. | Boulevard Garage and Sales Co. | Warren |
| Portland, Me. | W. M. Chellis | Franklin |
| Regina, Can. | D. L. Boureau | Kisselkar |
| Rochester, N. Y. | Ball-Washburne Motor Co. | Kisselkar |
| Salisbury, Md. | L. D. Collier | Kisselkar |
| Sedalia, Mo. | W. C. Evans | Kisselkar |
| South Bend, Ind. | S & C Auto Co. | Haynes |
| Spokane, Wash. | Spokane Auto Co. | Buick |
| Spokane, Wash. | Spokane Auto Co. | National |
| Vancouver, B. C. | Fox Brothers | Dayton |
| Washington, D. C. | Edward H. Bauer | Kisselkar |
| Welland, Ont., Can. | A. H. B. Nepp | Ford |
| West Point, Neb. | Brown Brothers | Kisselkar |
| Whitestown, Ind. | Clark & Smith | R. C. H. |
| Wheeling, W. Va. | R. C. Bowman | Marmon |
| Winnipeg, Can. | Lion Auto Garage | Marmon |

### TRUCKS

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| Baltimore, Md. | Walter Scott | Marmon |
| Columbus, O. | Reliance Truck and Garage Co. | G. M. C. |
| Davenport, Ia. | Davenport Auto Truck Co. | White |
| Davenport, Ia. | Davenport Auto Truck Co. | Velie |
| Minneapolis, Minn. | C. E. Haldeman | Decatur |
| Philadelphia, Pa. | Boulevard Garage and Sales Co. | Warren |

**BOSTON, Mass.**—The Bi-Motor Equipment Co., of Boston, has added the Knight to its line of accessories.

**Minneapolis, Minn.**—G. A. Scholtz, Northwestern Bank building, has taken the agency for the Rim-Grip subcasing made in Lincoln, Neb., by the Fisher Mfg. Co.

**Albany, N. Y.**—The W. N. Whitney & Co. has moved its motor car department to 450 Central avenue, which salesroom and service station was formerly occupied by the United Motor Albany Co.

**Indianapolis, Ind.**—The Eisemann Magneto Co. has opened a factory sales branch at 514 North Capitol avenue. The branch has a complete repair shop and service station, carrying a full line of parts and supplies.

**Baltimore, Md.**—Howard L. Crise, who recently entered the motor car supply business, has changed the name of his company to the H. L. Crise Auto Supply Co. and has opened up new quarters at 1916 North Charles street.

**Minneapolis, Minn.**—F. W. Oliver, former president of the Minnesota State Chauffeurs' Association, and Leo O. Grange, have bought the business, stock and equipment of the Auto Supply Depot, 178 Western avenue, St. Paul.

**Buffalo, N. Y.**—Announcement is made that Charles F. Monroe has purchased the United Motor Buffalo Co. from the United States Motor Co. Mr. Monroe, who was manager of the company, took over the United Motor Buffalo Co.'s interests and will continue the distributing of the United States Motor Co. products for the northern part of New York and western Pennsylvania.

**Akron, O.**—The Portage Rubber Co. is doubling its plant capacity at Barberton. Several new buildings are being erected.

**Milwaukee, Wis.**—F. O. Kraatz, formerly of the A. O. Smith Co., of Milwaukee, has been employed by the Beaver Mfg. Co. to act as outside man for its purchasing department.

**Bridgeport, Conn.**—The firm of Setzer & Beach has been dissolved. The new organization will be run under the name of Bernard Setzer, continuing to handle the Cole line at 361 Fairfield avenue.

**Washington, D. C.**—The Goodyear Tire and Rubber Co.'s branch has been removed from 1026 Connecticut avenue to 1016 Fourteenth street, where a three-story brick and stone building has just been erected.

**Philadelphia, Pa.**—Edward K. Leech, general manager of the Commercial Car Journal, will assume the management of the local branch of the Oakland Motor Car Co. to be established here on September 1, the new branch superseding the Oakland Co. of Pennsylvania, which, for the past 3 years, has handled the Oakland car.

**Columbus, O.**—Orville W. Lawson, well known in local automobile circles, and more recently in charge of factory sales for the Studebaker Corporation in Texas and Mexico, with headquarters at San Antonio, is now connected with the branch at Columbus, O., the Twyman Motor Car Co., distributors of the Studebaker output in Ohio, West Virginia and part of Kentucky.

**Akron, O.**—The Swinehart Tire and Rubber Co. has secured A. E. Williams as advertising manager. He was formerly with the Firestone Tire and Rubber Co.

**Spokane, Wash.**—L. D. Hewitt, who for the past year has been engaged in the motor car business in Walla Walla, has joined the sales force of the Studebaker Corporation in Spokane.

**South Bend, Ind.**—A new garage will soon be erected on West First street, Mishawaka, to be occupied by Frank Miller. The new structure will be constructed of concrete blocks and will measure 40 by 90 feet.

**New York**—After September 1 the premises at 18-20 West Sixty-third street will be the New York headquarters for the whole line of Splitdorf ignition devices. Oscar J. Rhode will be in charge of the new Splitdorf headquarters.

**Dallas, Tex.**—M. C. Manroe, for several years manager for the Alamo Automobile Co. in Dallas, has been transferred to Houston. H. H. Fulkerson, assistant manager for the Alamo company, has accepted a position with the Abrams & Davis Co., representing the Stearns-Knight.

**Milwaukee, Wis.**—The Mitchell Automobile Co. of Milwaukee has re-opened its service building and sales headquarters at 528-532 Broadway. Two stories have been added and the equipment of the plant doubled, giving the Mitchell one of the finest service stations in the mid-

dle west. N. R. New, formerly of Chicago, is manager at Milwaukee.

**Akron, O.**—The Miller Rubber Co. is erecting a new building at a cost of $5,000. It will be of steel construction and will be used as a mixing department.

**Boston, Mass.**—George R. Bascom, who operates a garage at 31 Stanhope street, has gone into the accessory business and he has opened a place at 224 Columbus avenue.

**Montpelier, Vt.**—A new garage is being constructed at Montpelier for the Pavilion hotel, that is to be 100 by 52 feet and of three stories, making it one of the best garages in the state.

**Detroit, Mich.**—The Jiffy Auto Curtain Co. has opened a general sales office in Detroit, with headquarters at 527-528 Ford building. The office will be in charge of H. W. Kane and R. H. Baldwin as sales managers.

**Syracuse, N. Y.**—Hugh H. Goodhart, who for the past 3 years has been connected with the sales department of the Franklin Automobile Co., has resigned to accept a position on the advertising staff of the Lippard-Stewart Motor Car Co., of Buffalo.

**Baltimore, Md.**—H. S. Block, formerly manager for the local branch of the Stoddard-Dayton Auto Co., which has been abandoned here, has opened a garage and salesrooms on Morton street for the Stoddard-Dayton car, for which he is the local representative.

**South, Bend, Ind.**—The Seely Auto Sales and Training School has moved into its new quarters in the Ireland building. The first floor will be a garage and office, while the lecture rooms are on the second floor. H. C. Kingsley has taken charge of the school work.

**Minneapolis, Minn.**—J. W. Martin has been appointed manager of the Minneapolis branch of the Oakland Motor Co., 1518 Hennepin avenue. The company will establish a service station and carry parts of all models of the Oakland machines in stock for the use of northwestern customers.

**Indianapolis, Ind.**—J. M. Ward, who for the past 2 years has been connected with the Waverley Co., of Indianapolis, but probably better known as secretary of the Indiana Automobile Manufacturers' Association, has just accepted a position as assistant sales manager of the American Motors Co.

**Indianapolis, Ind.**—A number of changes are taking place in local motor car circles at the beginning of the 1913 season. One of the most important is the taking over of the salesroom at 427 North Meridian street formerly conducted by the Meridian Auto Co. by the Indianapolis Motor Car Co., which will continue the truck sales room and garage and in its new branch will have the agency for the Flanders electric and Everitt. The Finch-Freeman Automobile Co., upon the closing of the factory sales branch of the Regal, will take over the Regal agency.

**Buffalo, N. Y.**—C. W. Trautman has been appointed manager of the Buffalo factory branch of the Detroit Electric Co., 120, 1210 Main street.

**Indianapolis, Ind.**—W. D. Edenburn, formerly with the Remy Electric Co., has become manager of the newspaper advertising department of the Henderson Motor Car Co.

**Boston, Mass.**—The Perfection Tire Filler Co. has opened salesrooms in the Old South building, Boston, and a manufacturing and installing plant on the Fellsway boulevard, Somerville.

**Zanesville, O.**—The Mitchell-Zanesville Co. has taken over the Buckeye garage located at 32 Eighth street, and will continue the agency for the Mitchell car. The new company is composed of L. H. Wise and Phillip Basso.

**Buffalo, N. Y.**—The Willys-Overland Co., of Toledo, O., has purchased property at Main and St. Paul streets for the construction of a three-story fireproof building to be used as a salesroom for the Buffalo branch of that company.

**Columbus, O.**—The Cummins Auto Sales Co., of North Fourth street, announces its contract to distribute the Elmore in central Ohio expired July 1 and was not renewed. Hereafter the concern will devote its attention to the Krit and Everitt.

**Peoria, Ill.**—J. Clifford Turpin, a well-known aviator, has retired from aviation and has accepted a position in the sales department of the Bartholomew Co. Mr. Turpin will look after the sales of the Glide cars in territory throughout the west.

**Detroit, Mich.**—George D. Wilson, sales manager of the Warren Motor Car Co., has resigned to take charge of the sales of the Warren car for several eastern states, with headquarters in New York. Mr. Wilson will be eastern sales manager of the company.

**Columbus, O.**—Receiver McDowell, of the Columbus Taxi-Cab and Service Co., of Columbus, in a partial report made to the court recently, showed that the concern is making a profit under his management and promises to pay off all of the debts of the company.

**San Diego, Cal.**—Preparing for increased business, Darrell & Foster, Cole agent, has announced that after the first of the month the salesroom and agency will be located in the modern garage at 1345 First street. The Cole agency will share the garage with the Winton agency.

**Wilmington, Del.**—The Auto Pilot Lamp Co., of Camden, N. J., has been chartered under the laws of Delaware, with a capital of $25,000, to manufacture, buy, sell and deal in and with all kinds of devices and appliances for motor cars, etc. The incorporators are George H. B. Martin, E. T. Vinnell, of Camden, and C. M. Martin, of Philadelphia, Pa.

**Philadelphia, Pa.**—The Oakland Motor Car Co., of Pontiac, Mich., will on September 1 establish a branch in Philadelphia, to succeed the Oakland Co. of Pennsylvania, which has handled this car, as an agency for the past three years. The branch will be in charge of Edward K. Leech.

**Columbus, O.**—Manager Edward F. Adams, of the Columbus Auto Parts and Machine Co., which operates a plant at 575 North Fourth street, Columbus, announces that in the future the concern will confine itself to the manufacture of windshields instead of covering a general line of manufacturing.

**Indianapolis, Ind.**—Frank P. McLellan has been appointed Indiana representative for the Marvel Carburetor Co., which is moving from Indianapolis to Flint, Mich. Mr. McLellan has established quarters at 315 Susquehannah street, Indianapolis, where he will also be engaged in the motor car repair business with Oscar Wagner.

**Minneapolis, Minn.**—The Oakland Motor Car Co. is to open at 1518 Hennepin avenue. The garage was formerly occupied by the Kemp Bros. Automobile Co. The Kemps have moved to open their electric station at Hennepin and Bryant avenues. The Oakland company is in the factory branch. The car was represented locally here by an agency heretofore.

**Cedarburg, Wis.**—The A. J. Meyer Motor Car Co., the incorporation of which was recently noted, will engage at once in the manufacture of the Meyer cushion hub wheel, the invention of August J. Meyer, of Chicago. The wheel is adaptable particularly for commercial cars, although it can be built in a lighter type for pleasure cars.

**Columbus, O.**—The Central garage is the name of a new concern which has been opened in a remodeled building at 145-149 North Fifth street, with Ira N. Thompson, formerly Columbus agent for the Inter-state, as proprietor and manager. The concern has room for about forty cars. For the present the concern handles the Auburn line of cars.

**LaCrosse, Wis.**—Joseph E. and August J. Hoffweber of LaCrosse, Wis., are negotiating with capital in several industrial centers of Wisconsin for the financing of a company which has been incorporated under the style of Hoff Motor Car Co., capital $500,000, to manufacture a line of pleasure cars. The Hoff car was designed by the Hoff brothers.

**North Yakima, Wash.**—The Franklin Sales Co. was recently organized to conduct a general sales business and will have the agency for the Franklin. The officers are: John A. Nichols, Jr., president; George C. Arrowsmith, vice-president; Thomas R. Robinson, secretary and treasurer. The company will have headquarters and salesroom in a new building being

erected on North Third street, which will be ready for occupancy September 1.

**Jackson, Mich.**—F. S. Rowan has accepted the position of advertising manager of the Clarke-Carter Auto Co., Jackson, Mich., manufacturer of Cutting cars.

**Minneapolis, Minn.**—The Schornstein Auto Co. will open a new garage at Hudson and Bates avenues, St. Paul. Supplies and accessories will be carried.

**Racine, Wis.**—William Anderson, of Racine, Wis., has sold the garage and business conducted under the name of the Washington Garage to Klaiber Hansen, formerly manager of the garage of the Horlicks at Racine.

**Boston, Mass.**—J. E. Wilbur & Co. have opened a garage at 1509 Blue Hill avenue in the Mattapan section of Boston that comprises a two-story structure with a capacity of from sixty-five to seventy cars. E. Horten has been appointed manager.

**Charlestown, Mass.**—Percy G. Dockham, of Boston, and Thomas Johnson, of Somerville, doing business as the Taylor Mfg. Co., handling supplies at 468 Main street, Charlestown, have made an assignment to W. Hubert Wood for the benefit of their creditors.

**Lima, O.**—Henry Mack will soon start a large addition to his garage on West Market street, and while the work is being done a large tent will be utilized as a tempopary garage. The remodeling of the building contemplates the erection of two additional stories.

**Columbus, O.**—The State garage is the name of a new concern which has been opened on East Chapel street for the purpose of doing a general garage business and operating a repair shop. The concern consists of a partnership of H. S. Richwine and H. H. Jones. The concern occupied a building with two stories and containing 20,000 square feet of space. A full line of supplies is being carried.

**Dayton, O.**—The Mation Automobile Co., of Dayton, O., has filed papers with the secretary of state changing its name to the Majestic Motor Car Co.

**Baltimore, Md.**—The Marathon Motor Sales Co., which handles the Marathon car in this territory, has opened showrooms at 1117 Hunter alley. The service station will be continued at 10 Morton street.

**Washington, D. C.**—Edward Wilkie has been appointed manager of the Buick Motor Co.'s branch here, succeeding T. S. Johnston, who resigned to accept the position of southern sales manager for the Republic Motor Co.

**Lima, O.**—W. H. Moore, who formerly was manager of the sales department of the Gramm Co., has resigned that position to take a similar position with the Gramm-Bernstein Co., which will soon open a plant for the manufacture of trucks here.

**Columbus, O.**—The Engle & Vincent Automobile Co., recently incorporated with a capital of $15,000, has taken over the garage and sales agency located at 11 Parsons avenue, which was formerly controlled by Charles H. Engle and Frank L. Vincent as a partnership.

**Columbus, O.**—The Everitt Automobile Co. is the name of a branch which has opened at 307 and 309 Mt. Vernon avenue, Columbus, O., for the distribution of the Everitt cars in Ohio and parts of Indiana, Kentucky and West Virginia. The concern occupies a new garage at that point.

**La Crosse, Wis.**—The General Motor Car Co. has been organized at La Crosse, Wis., as a corporation with an authorized capital of $10,000 to deal in motor cars and commercial vehicles. Martin W. Rybold, for many years sales manager of the La Crosse Plow Co., northwestern distributor for the Imperial and Dart; Joseph P. Krett, Louis L. Fox and Henry F. Fox are the incorporators.

**Akron, O.**—The contract for the erection of a one-story brick and concrete office building for the Firestone Tire and Rubber Co., of Akron, has been awarded.

**Dallas, Tex.**—The name of the Cole representation at Dallas has been changed to the Cole Motor Car Co. Vice-President S. J. Kuqua, of the Cole factory, is in Dallas.

**Bretton Woods, N. H.**—D. E. Harvey, New England manager for the Hartford Suspension Co., has opened a branch at Bretton Woods for the sale of the various accessories made by that company.

**Washington, D. C.**—The Potomac Motor Car Co. has leased 1226 Connecticut avenue, N. W., for a term of years, and after extensive improvements will remove from its present quarters at 1218 Connecticut avenue. The company handles the Marmon line.

**Atlanta, Ga.**—M. Nabors and R. M. Northcutt have acquired the retail sales department for the Cole and Alco pleasure cars and the Alco and Federal trucks. The business will be done under the name of the Cole Motor Car Co. of Georgia, located at 239 Peachtree street.

**Minneapolis, Minn.**—The United States Tire Co. has opened a new branch in the recently completed building at 1522-1524 Hennepin avenue. The building is two stories and basement, 35 by 120 feet, with capacity to store 12,000 casings. Show rooms and offices will be on the first floor.

**Boston, Mass.**—The W. L. Russell Co., handler of the Regal in Boston, doing a retail business, has decided to take on the wholesale end also. The retail business will be conducted in the Park square salesrooms with the Haynes and Veerac truck, while the wholesale business will be conducted from the motor mart near by.

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# Recent Incorporations

**Baldwin, L. I.**—Acme Auto Rental Co., Inc., capital stock, $5,000; incorporators, G. Wintjen, A. Meiselbach, A. C. Ewing.

**Baltimore, Md.**—Lyon Motor Car Co., capital stock, $50,000; incorporator, E. B. Lyon.

**Boston, Mass.**—E. C. Andrews Co., capital stock, $10,000; motor car furnishings; incorporators, E. C. Andrews, H. R. Lynn. W. J. Riggs, Z. A. Hall, S. M. Andrews.

**Boston, Mass.**—Amberine Lubricants Co., capital stock, $5,000; to deal in lubricating oils, etc.; incorporators, I. I. Slevins, Harry B. Golden, N. Rozen.

**Buffalo, N. Y.**—Buffalo-Akron Transit Co., capital stock, $2,000; to operate motor bus line; incorporators, W. H. Pensyres, G. Kunz, F. Christiansen.

**Cambridge, Mass.**—Cambridge Station Garage, Inc., capital stock, $6,000; directors, David J. Murphy, J. J. Guiney, F. W. Roberts.

**Chicago**—Columbus Monument Garage, capital stock, $2,500; general garage; incorporators, J. T. Crotty, F. C. Taylor, J. J. Poulton.

**Chicago**—M. R. L. Resilient Tire Co., capital stock, $100,000; to deal in nonpuncturable tires; incorporators, M. R. Labbee, M. O. Lundholm, R. W. More.

**Cortland, N. Y.**—Brockway Motor Truck Co., capital stock, $100,000; incorporators, George A. Brockway, C. S. Pomeroy, F. R. Thompson.

**Detroit, Mich.**—Standard Motor Truck Co., capital stock, $50,000.

**Dallas, Tex.**—Marris-Lingo Motor Co., capital stock, $7,500; incorporators, A. A. Marris, D. C. Lingo, J. W. Fox.

**Elizabeth, N. J.**—Franklin Auto Co., capital stock, $25,000; general motor car business; incorporators, W. H. Reynolds, M. Gordon, L. Koplan.

**Hempstead, N. Y.**—Smith's Garage, Inc., capital stock, $2,000; incorporators, Lawrence Schultz, J. Pensook, R. McCombs.

**Indianapolis, Ind.**—Koogle Automobile Co., capital stock, $10,000; to deal in motor cars; incorporators, I. G. Koogle, C. P. Kline, L. D. Buenting.

**Jacksonville, Fla.**—Miller Auto Co., capital stock, $10,000; general motor car business; incorporators, F. C. Miller, J. C. Wright, G. L. Haselma.

**Kittery, Me.**—Non-Heating Lubricating Co. capital stock, $300,000; to deal in lubricating oils, etc.; directors, A. Tutleman, C. E. Smothers, H. Mitchell.

**LaCrosse, Wis.**—General Motor Car Co., capital stock, $10,000; to deal in motor cars and trucks; incorporators, M. W. Rybold, J. P. Krett, L. L. Fox H. F. Fox.

**Lexington, Ky.**—Commercial Auto Co., capital stock, $1,500; incorporators, J. N. Gibbons, W. B. Wiliams, E. N. Williams.

**Maplewood, N. J.**—Twentieth Century Bearing Co., capital stock, $100,000; incorporators, Menzo Loucks, Van Alstyne Loucks, A. T. Bunzey, G. H. Porter, F. L. Zabriskie.

**Newark, N. J.**—Sullivan Automobile Co., capital stock, $25,000; incorporators, James Sullivan, C. Bagole. W. N. Franzel.

**New York**—Henderson Eastern Motors Co., capital stock, $20,000; to deal in motor cars; incorporators, H. Harris, E. Knight Harris, L. Friedman.

**New York**—Ideal Steel Wheel Co., capital stock, $500,000; to manufacture steel wheels for motor cars; incorporators, A. F. Parket, J. E. Strietelmeier, D. E. Kirgan, W. C. Taylor, J. B. O'Donnell.

**New York**—Reliance Taxicab Co., capital stock, $500; incorporators, N. F. Yeagle, E. Yeagle, K. Lally.

**New York**—Fox-Heggi Co., capital stock, $6,000; painting and repairing motor cars; incorporators, A. Fox, Otto Hegyi, I. Hegyi.

**New York**—New York Electric Vehicle Association, capital stock, $50,000; incorporators, G. Tiernan, F. H. Parcells, R. G. Redlefsen.

**New York**—George Leverne Co., capital stock, $5,000; to deal in motor cars; incorporators, G. Leverne, J. L. Meyer, C. E. Lauten.

**Philadelphia, Pa.**—McGraw Tire and Rubber Co., capital stock, $100,000; to manufacture motor car tires; incorporator, G. Raymont Collins.

**Porland, Me.**—Auto Air-Rotar Co., capital stock, $15,000; directors, A. F. Jones, T. L. Croteau, J. E. Manter.

**San Antonio, Tex.**—Guarantee Motor Car Co., capital stock, $10,000; incorporators, J. F. Hagan, H. J. Smith, C. W. Voss.

**Union, N. J.**—Clifton Automobile Co., capital stock, $10,000; to manufacture and deal in motor cars; incorporators, B. F. M. Krom, W. A. Schuette, C. Schuette.